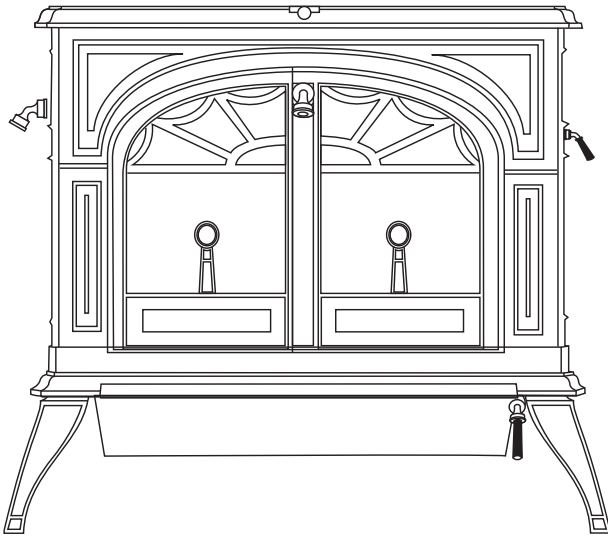
VERMONT CASTINGS

Defiant®

Non-Catalytic / Catalytic Woodburning Stove

Model 1975



Homeowner's Installation and Operating Manual

For use in the
United States and Canada

SAFETY NOTICE: IF THIS APPLIANCE IS NOT PROPERLY INSTALLED, OPERATED AND MAINTAINED, A HOUSE FIRE MAY RESULT.
TO REDUCE THE RISK OF FIRE, FOLLOW THE INSTALLATION INSTRUCTIONS. FAILURE TO FOLLOW INSTRUCTIONS MAY RESULT IN PROPERTY DAMAGE, BODILY INJURY OR EVEN DEATH. CONTACT LOCAL BUILDING OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

NATIONAL FIREPLACE INSTITUTE NFI CERTIFIED www.nficertified.org

We recommend that our woodburning hearth products be installed and serviced by professionals who are certified in the U.S. by the National Fireplace Institute® (NFI) as NFI Woodburning Specialists or who are certified in Canada by Wood Energy Technical Training (WETT).

Wood Energy Technical Training www.wettinc.ca

Do Not Discard This Manual: Retain for Future Use

30005220 5/12 Rev. 11

Welcome

Congratulations on your choice of a Vermont Castings Defiant stove. With this purchase you have made a commitment to make the hearth a place of warmth, beauty and comfort in your home. At MHSC, we share that joy and appreciation for the hearth. We assure you that your cast-iron Vermont Castings stove has been made with the utmost care and will provide you with many years of service.

As you become acquainted with your new stove, you will find that its appearance is matched by its functionality, due to cast iron's unique ability to absorb and radiate heat.

Also, MHSC products are among the cleanest-burning wood stoves and fireplaces available today. As an owner of a Vermont Castings stove, you make a strong statement for pollution-free energy. However, clean burning depends on both the manufacturer and the operator. Please read this manual carefully to understand how to properly operate and maintain your stove.

At MHSC, we are equally committed to your satisfaction as a customer. That is why we maintain an exclusive network of the finest dealers in the industry. Our dealers are chosen for their expertise and dedication to customer service. They are factory-trained and knowledgeable about every MHSC product. Feel free to contact your Authorized Vermont Castings Dealer anytime you have a particular question about your stove or its performance.

This manual contains valuable instructions on the installation and operation of your Vermont Castings Defiant. It also contains useful information on maintenance. Please read the manual thoroughly and keep it as a reference.

Sincerely,

All of Us at MHSC

This manual describes the installation, operation, and maintenance of the Vermont Castings Defiant Model 1975 Non-Catalytic / Catalytic wood burning heater. This heater meets the U.S. Environmental Protection Agency's emission limits for wood heaters sold on or after July 1, 1990. Under specific test conditions this heater has been shown to deliver heat at rates ranging from 8,200 to 33,000 Btu/hr.

The Defiant Model #1975 has been tested and is listed by OMNI-Test Laboratories of Portland, Oregon. The test standards are ANSI/UL-1482 and ANSI/UL-737 for the United States, and ULC S627 for Canada. The Defiant is listed for burning wood only. Do not burn other fuels. The Defiant is not approved for use in manufactured (mobile) homes.

We recommend that you hire a professional installer certified by the Wood Heat Education and Research Foundation (WHERF) or the Wood Energy Technical Training (WETT) to install your stove, or to advise you on the installation should you attempt to install it yourself.

Please read this entire manual before you install and use your new stove. Failure to follow instructions may result in property damage, bodily injury, or even death.

Save These Instructions for Future Reference

The Story of the Defiant

No wood-burning appliance, save for Ben Franklin's Pennsylvania Fireplace, has a stronger heritage than the Vermont Castings Defiant. Named for a 19th-century steamship, the original Vermont Castings Defiant Wood Stove came to epitomize America's resolve and independence during the Energy Crisis of the 1970s.

The year was 1975. With energy prices going through the roof, without an attractive or efficient wood stove to be found anywhere, two entrepreneurs set out to create a stove that was both beautiful and highly functional. Finely crafted from cast iron, the Defiant was the first wood stove to combine an artistically designed exterior with a methodically engineered interior, using new technologies for efficient combustion.

Americans purchased over a quarter-million Defiants, as they rediscovered the common sense of heating with wood, a home-grown fuel with none of the political and economic entanglements of foreign oil.

Thirteen years later, in 1988, Vermont Castings 'retired' the Defiant, replacing it with modern wood-burners such as the Encore. A decade later the Defiant was resurrected and updated with aesthetics and features that again led the industry.

In 2010, the third generation of the Defiant maintains the product's rich tradition by introducing the most advanced wood-burning stove on the market. The quality and classic look that consumers have come to expect from Vermont Castings is combined with the latest combustion technology, an innovative design that allows the stove to quickly be converted to burn in either a catalytic or noncatalytic mode. In a sense, the Defiant Model 1975 has been 35 years in the making.

Due to its significant role in American history, the original Defiant model is in the permanent collection of the Smithsonian Institution in our nation's capitol. Each new purchase of the Defiant continues that proud history.

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Proposition 65 Warning: Fuels used in gas, wood-burning or oil fired appliances, and the products of combustion of such fuels, contain chemicals known to the State of California to cause cancer, birth defects and other reproductive harm.
California Health & Safety Code Sec. 25249.6

Installation Accessories

Warming Shelf
- #0210 Classic Black
- #0211 Biscuit
- #0213 Ebony
- #0214 Bordeaux
- #0217 Brown Majolica

#3265* Outside Air Kit
#3180 Outside Air Adapter
#1907 Firescreen
#1860 6" x 12" Oval Starter Pipe
FK26 Fan Kit
#3190 Connector Pipe Heat Shield

A line of porcelain enamel stove pipe is available in Biscuit, Bordeaux, Ebony, Brown Majolica colors.
*If you order #3265, you will also need #3180.

Specifications

Defiant, Model 1975

EPA Emissions rating - Noncatalytic..... 2.3 g/hr*
Range of heat output - Noncatalytic .....8,200 - 33,000
EPA Emissions rating - Catalytic ..... 1.1 g/hr*
Range of heat output -
Catalytic ..... 10,000 to 30,300 BTU/hr.*
Peak heat output .....75,000 BTU/hr.**
Area heated.....Up to 2,400 Square feet***
Fuel length.....25”
Fuel capacity ..... 70 pounds, hardwood
Loading.....Front and top
Chimney Connector:
for 8” flue collar ..... 8” (203 mm) diameter
Chimney Flue Size:
with 8” Chimney Connector..8” (203 mm) minimum
with 6” Chimney Connector..6” (152 mm) minimum
Flue exit position..... Top or Rear
Primary Air..... Manually Set, Thermostatically Maintained
Secondary Air .....Fixed, self-regulating
Ash handling system .....Removable ash pan
Glass panels..... High-temperature ceramic
Weight .....518 lbs. (235 kg.)
Width (leg to leg) ..... 32⅜” (822 mm)
Depth (leg to leg)..... 19” (483 mm)
Height to top of flue collar..... 29⅞” (759 mm)

*Under specific conditions during EPA emissions testing.

** This value can vary depending on how the stove is operated, the type and moisture content of the fuel used, as well as the design, construction and climatic location of your home. Figures shown are based on maximum fuel consumption rates obtained under laboratory conditions and on average efficiencies.

*** These values are based on operation in building code-conforming homes under typical winter climate conditions in New England. If your home is of nonstandard construction (e.g. unusually well insulated, not insulated, built underground, etc.) or if you live in a more severe or more temperate climate, these figures may not apply. Since so many variables affect performance consult your Authorized Dealer to determine realistic expectations for your home.

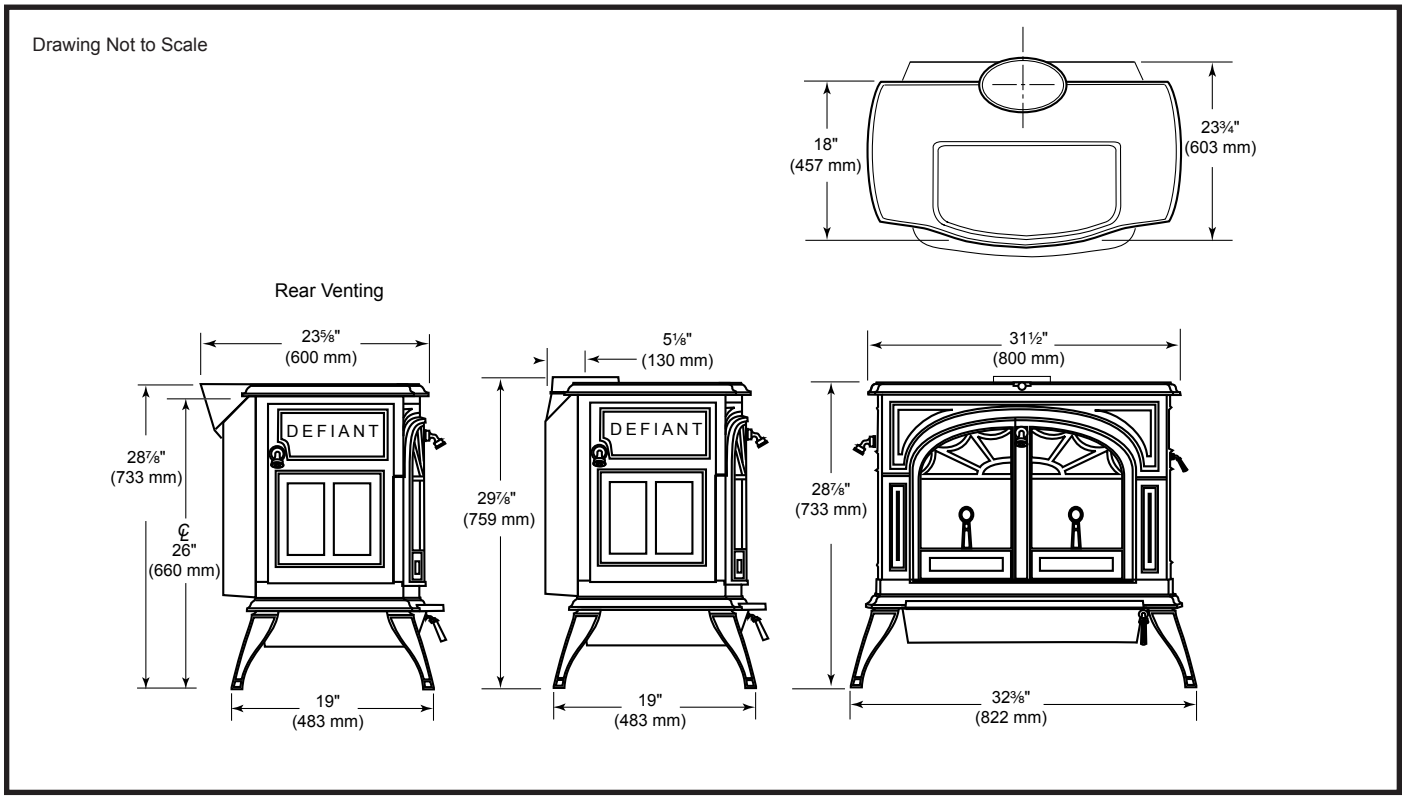


Fig. 1 Defiant 1975 dimensions.

Installation

SAFETY NOTICE: IF YOUR DEFIANT IS NOT PROPERLY INSTALLED, A HOUSE FIRE MAY RESULT. TO REDUCE THE RISK OF FIRE, FOLLOW THE INSTALLATION INSTRUCTIONS. CONTACT LOCAL BUILDING OR FIRE OFFICIALS ABOUT RESTRICTIONS AND INSTALLATION INSPECTION REQUIREMENTS IN YOUR AREA.

Before you begin an installation, be sure that:

- Your stove and chimney connector will be far enough from combustible material to meet all clearance requirements.
- The floor protector is large enough and is constructed properly to meet all requirements.
- You have all necessary permits from local authorities.

Your local building official is the final authority for approving your installation as safe and determining that it meets local and state codes.

The metal label permanently attached to the back of every Vermont Castings' stove indicates that the stove has been tested to current UL and ULC standards, and gives the name of the testing laboratory. Clearance and installation information also is printed on the label. When the stove is installed according to the information both on the label and in this manual, local authorities usually will accept the label as evidence that the installation meets codes and can be approved.

However, codes vary in different areas. Before starting the installation, review your plans with the local building authority. Your local dealer can provide any additional information needed.

For any unresolved installation issues, refer to the National Fire Protection Association's publication ANSI/NFPA 211 Standard for Chimneys, Fireplaces, Vents and Solid Fuel Burning Appliances. For Canada, the equivalent publication is CSA CAN-B365 Installation Code for Solid Fuel Burning Appliances and Equipment. These standards are the basis for many national codes. They are nationally recognized and are accepted by most local authorities. Your local dealer or your local building official may have a copy of these regulations.

IMPORTANT: Failure to follow these installation instructions may result in a dangerous situation, including a chimney or house fire. Follow all instructions exactly, and do not allow makeshift compromises to endanger property and personal safety.

Outside Air

In some modern, super-insulated homes, there may be inadequate air supply for combustion because of insufficient air infiltration into the building. Such air enters a home through unsealed cracks and openings. Exhaust fans in kitchens or bathrooms can compete with the stove for available air and compound the problem.

When poor draft is caused by a low infiltration rate, opening a ground floor window on the windward side of the house and near the stove will usually alleviate the problem.

A better solution is to install a permanent outside air supply to the stove and/or room. In fact, bringing air for combustion from outside the home directly to the air inlet of the stove is required for new construction in some areas.

Pressure variations within the house do not affect a stove equipped with an outside air supply, and improved stove performance often results. An Outside Air Kit for the Defiant is available from your local dealer.

Chimney Height

Altitude affects chimney performance. When using an 8" oval to 6" flue collar adapter on the Defiant, refer to Figure 1 for suggested chimney heights at various altitudes. Chimney height should be measured from the flue collar to the top of the chimney. The recommended minimum chimney height is 16' (5 m).

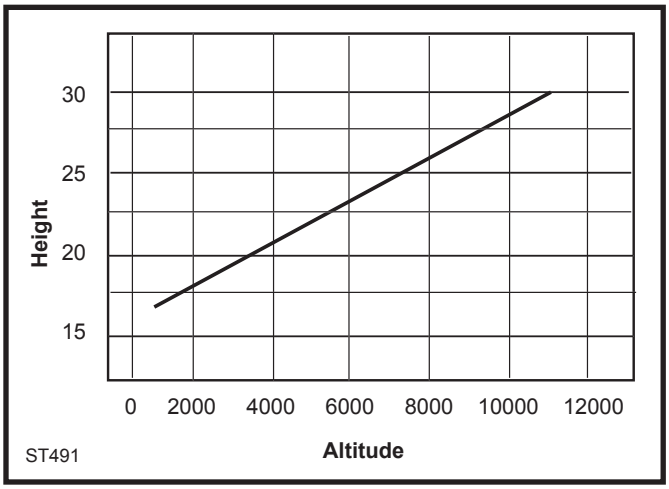


Fig. 2 Chimney height requirements with 6" chimney and/or chimney connector.

What Kind of Chimney to Use

You must connect the Defiant to a code-approved masonry chimney with a flue liner, to a relined masonry chimney that meets local codes, or to a prefabricated metal chimney that complies with the requirements for Type HT chimneys in the Standard for Chimneys, Factory-Built, Residential Type and Building Heating Appliance, UL 103. Figure 3 illustrates the two types. The chimney and chimney connector must be in good condition and kept clean.

If you use an existing masonry chimney, it must be inspected to ensure it is in a safe condition before the stove is installed. Your local professional chimney sweep, building inspector, or fire department official will be able to inspect the chimney or provide a referral to someone who can. See “Chimney and Fireplace hazards”, in the appendix, for particulars.

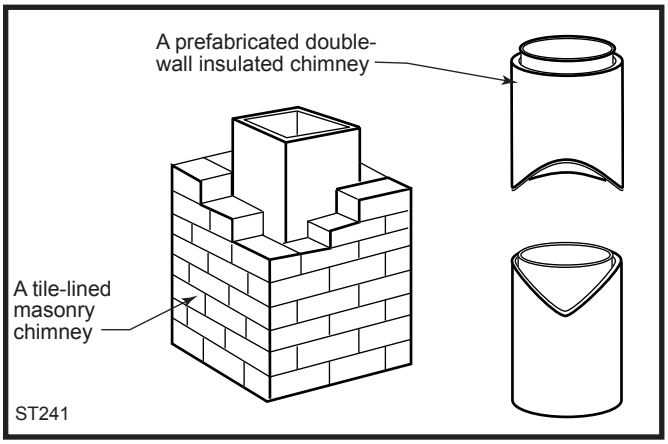


Fig. 3 Approved chimney types.

The chimney must extend at least 3’ (914 mm) above the highest point where it passes through or near a roof, and at least 2’ (610 mm) higher than any part of a building within 10’ (3 m) horizontally. (Fig. 4)

For proper draft and good performance, any chimney used with a Defiant should extend at least 16’ (5 m) above the flue collar of the stove.

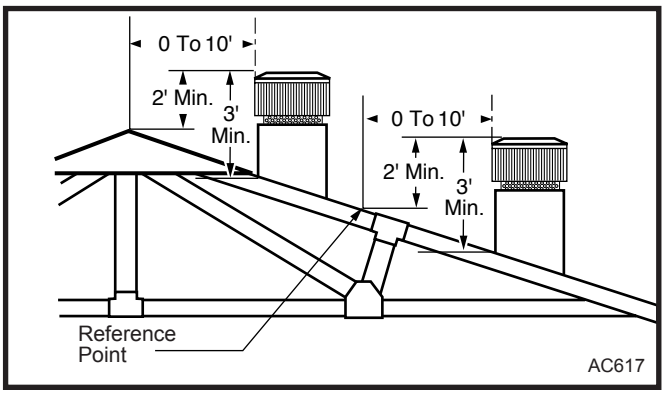


Fig. 4 The 2’-3’10’ Chimney Rule.

Masonry Chimneys

An inspection of the chimney must confirm that it has a lining. Do not use an unlined chimney. The chimney should have no cracks, loose mortar, other signs of deterioration, and blockage. Repair any defects before the chimney is used with your stove.

Unused openings in an existing masonry chimney must be sealed with masonry to the thickness of the chimney wall, and the chimney liner should be repaired. Openings sealed with pie plates or wallpaper are a hazard and should be sealed with mortar or refractory cement. In the event of a chimney fire, flames and smoke may be forced out of these unused thimbles.

The chimney should be thoroughly cleaned before use.

A newly-built masonry chimney must conform to the standards of your local building code or, in the absence of a local code, to a recognized national code. Masonry chimneys must be lined, either with code-approved masonry or pre-cast refractory tiles, stainless steel pipe, or a code-approved, “poured-in-place” liner. The chimney’s clean-out door must seal tightly. A loose or leaky clean-out door can weaken chimney draft, causing performance problems.

Prefabricated Chimneys

A prefabricated metal chimney must be one tested and listed for use with solid-fuel burning appliances to the High-Temperature (H.T.) Chimney Standard UL-103-1985 (2100°F) for the United States, and High Temperature (650°C) Standard ULC S-629 for Canada.

DO NOT CONNECT THIS UNIT TO A CHIMNEY FLUE SERVING ANOTHER APPLIANCE.

Chimney Size

A Defiant with an 8” (203 mm) flue collar is approved for venting into a masonry chimney with a nominal flue size of 8” x 8” (203 x 203 mm) or 8” x 12” (203 x 305 mm), and into a round flue with nominal flue size of 8” (203 mm). A Defiant with a 6” (152 mm) flue connector is approved for venting into a masonry chimney with a nominal flue size of 8” x 8” (203 x 203 mm), and into a round flue with nominal flue of 6” (152 mm).

NOTE: When installed with a 6” flue collar, the Defiant may not be operated with the front doors open.

Whatever the flue collar size, a Defiant may be vented into larger chimneys as well. However, chimneys with liners larger than 8” x 12” (203 x 305 mm) may experience rapid cooling of smoke and reduction in draft, especially if the chimneys are located outside the home. These large chimneys may need to be insulated or have their flues relined for proper stove performance.

Accessories to help make the connection between stainless steel chimney liners and your Defiant are available through your local dealer.

Chimney Connector Guidelines

A chimney connector is the single-wall pipe that connects the stove to the chimney. The chimney itself is the masonry or prefabricated structure that encloses the flue. Chimney connectors are used only to connect the stove to the chimney.

Single-wall connectors should be made of 24 gauge or heavier steel. Do not use galvanized connector; it cannot withstand the high temperatures that can be reached by smoke and exhaust gases, and may release toxic fumes under high heat. The connector may be 6" (152 mm) or 8 " (203 mm) in diameter.

If possible, do not pass the chimney connector through a combustible wall or ceiling. If passage through a combustible wall is unavoidable, refer to the section on Wall Pass-Throughs. Do not pass the connector through an attic, a closet or similar concealed space. The whole connector should be exposed and accessible for inspection and cleaning.

In horizontal runs of un shielded chimney connector, maintain a distance of 30" (762 mm) from the ceiling. Keep it as short and direct as possible, with no more than two 90° turns. Slope horizontal runs of connector upward 1/4" per foot (6mm per meter) going from the stove toward the chimney. The recommended maximum length of a horizontal run is 3' (1 m), and the total length should be no longer than 8' (2.4 m). In cathedral ceiling installations, extend the prefabricated chimney downward to within 8' (2.4 m) of the stove. This will help maintain a good draft by keeping the smoke warm, so that it rises readily.

Wear gloves and protective eyewear when drilling, cutting or joining sections of chimney connector.

Single-wall Chimney Connectors

- Begin assembly at the flue collar of the stove. Insert the first crimped end into the stove's flue collar, and keep each crimped end pointing toward the stove. (Fig. 5) Using the holes in the flue collar as guides, drill 1/8" (3 mm) holes in the bottom of the first section of chimney connector and secure it to the flue collar with three #10 x 1/2" sheet metal screws. Lift off the griddle, and shield the stove's surface between the griddle opening and the front of the flue collar to protect the finish when you drill the front hole.
- Fasten each joint between sections of chimney connector, including telescoping joints, with at least three (3) sheet metal screws. The pre-drilled holes in the top of each section of chimney connector serve as guides when you drill 1/8" (3 mm) holes in the bottom of the next section.
- Fasten the chimney connector to the chimney. Instructions for various installations follow. Figure 6 illustrates the general layout of chimney connector parts.
- Be sure the installed stove and chimney connector are correct distances from nearby combustible materials.

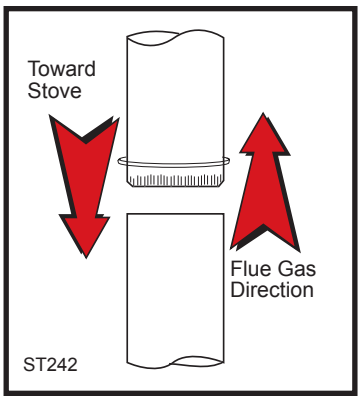


Fig. 5 Chimney connector.

NOTE: Special slip pipes and thimble sleeves that form telescoping joints between sections of chimney connector are available to simplify installations. They often eliminate the need to cut individual connector sections. Consult your local dealer about these special pieces.

Securing the Single-wall Connector to a Prefabricated Chimney

Follow the installation instructions of the chimney manufacturer exactly as you install the chimney. The manufacturer of the chimney will supply the accessories to support the chimney, either from the roof of the house, at the ceiling of the room where the stove is installed, or from an exterior wall.

Special adapters are available from your local dealer to make the connection between the prefabricated chimney and the chimney connector. The top of such adapters attaches directly to the chimney or to the chimney's ceiling support package, while the bottom of the adapter is screwed to the chimney connector.

These adapters are designed so the top end will fit outside the inner wall of the chimney, and the bottom end will fit inside the first section of chimney connector.

Securing the Single-wall Connector to a Masonry Chimney

Both freestanding masonry chimneys and fireplace masonry chimneys may be used for your installation.

Freestanding Installations

If the chimney connector must pass through a combustible wall to reach the chimney, follow the recommendations in the Wall Pass-Through section that follows. The opening through the chimney wall to the flue (the "breech") must be lined with either a ceramic or metal cylinder, called the "thimble", which is cemented

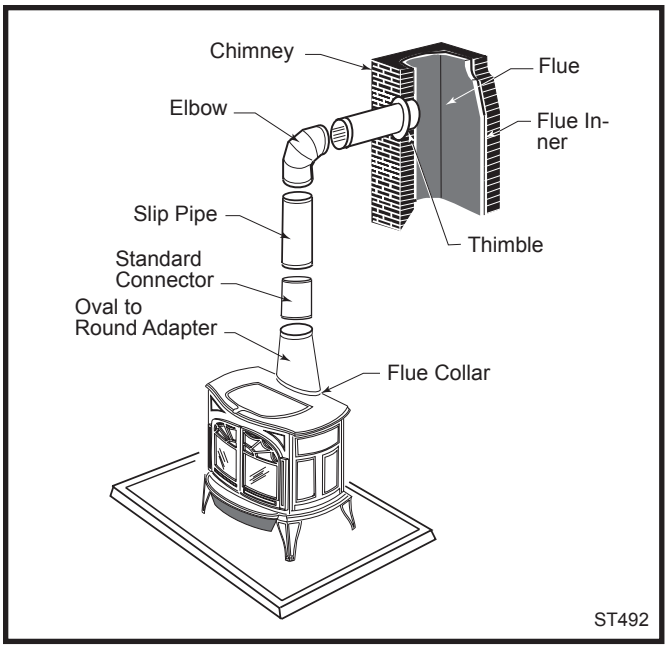


Fig. 6 An exploded view of the chimney connection in a free-standing masonry installation.

securely in place. Most chimney breeches incorporate thimbles, but the fit must be snug and the joint between the thimble and the chimney wall must be cemented firmly.

A special piece called the “thimble sleeve,” slightly smaller in diameter than standard connectors and most thimbles, will facilitate the removal of the chimney connector system for inspection and cleaning. (Fig. 7) Thimble sleeves are available from your local dealer.

To install a thimble sleeve, slide it into the breech until it is flush with the inner flue wall. Do not extend it into the actual flue passage, as this could interfere with the draft.

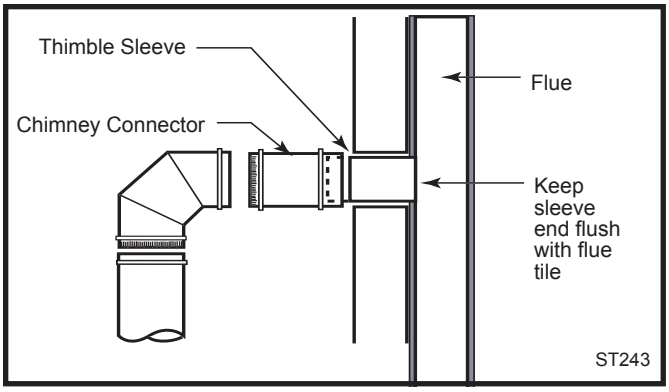


Fig. 7 The thimble, made of either ceramic or metal, must be cemented securely in place.

The thimble sleeve should protrude 1-2” (25-50 mm) into the room. Use furnace cement and thin gasketing to seal the sleeve in place in the thimble. Secure the chimney connector to the outer end of the sleeve with sheet metal screws.

Without a thimble, a suitable length of chimney connector can be extended through the breech to the inner face of the flue liner, and cemented securely in place. Additional pieces of connector are then attached with sheet metal screws.

Fireplace Installations

The chimney connector may be connected to the chimney above the fireplace opening or through the fireplace.

Above the Fireplace

The Defiant may be connected to a chimney above a fireplace opening. (Fig. 8) In such installations, the stove is positioned on the hearth in front of the fireplace and the chimney connector rises from the stove top and then angles ninety degrees back into the chimney. The chimney liner should extend to the point at which the chimney connector enters the chimney.

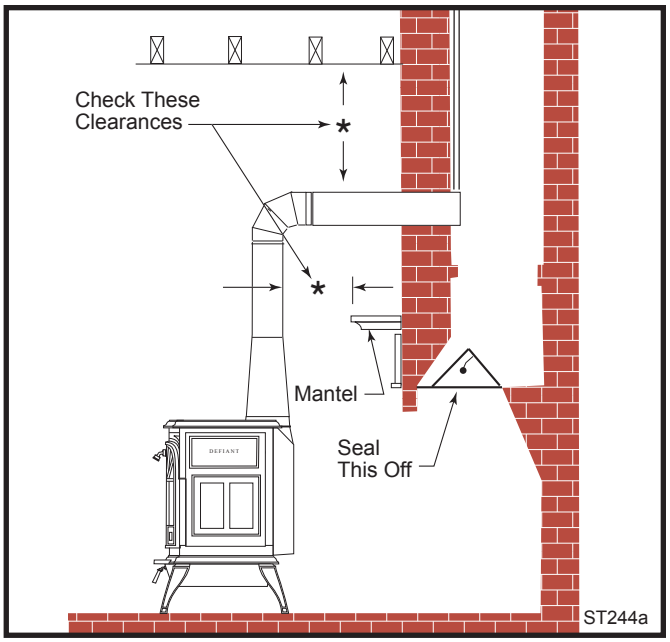


Fig. 8 In this installation, the chimney connector attaches to the chimney above the fireplace opening.

If the chimney connector in your installation enters the chimney above a fireplace, follow all the guidelines mentioned above for freestanding installations. In addition, give special consideration to the following points:

- Check the clearance between the stove and the chimney connector, and any combustible trim or the mantel.
- Check the clearance between the chimney connector and the ceiling. The clearance should be at least 30” (762 mm) with unshielded connectors. Consult the clearance charts for other installation options.
- The fireplace damper must be sealed to prevent room air from escaping up the flue. However, it

must be possible to re-open the damper to inspect or clean the chimney.

Through the Fireplace

If your fireplace opening height is at least 29" (737 mm), you may install a Defiant through the opening using a “positive connection” kit, available from your local dealer. Positive connection kits ensure a tight fit between the stove flue collar and the chimney flue. (Fig. 9)

Fireplace installations, whether connected to the flue above or through the fireplace opening, have special clearance requirements to adjacent trim and the mantel. You’ll find the required safe clearances for Defiant fireplace installations on Page 13.

Floor protection requirements also apply to fireplace installations. This information is on Page 11.

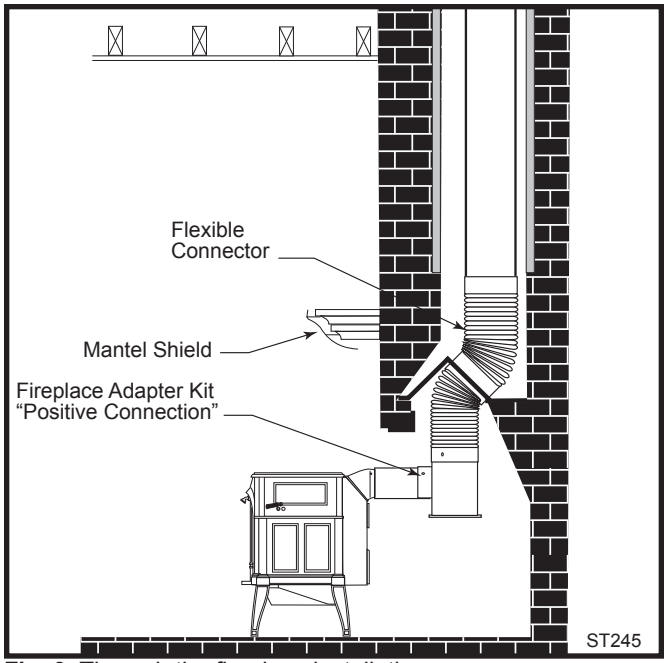


Fig. 9 Through the fireplace installation.

Wall Pass-Throughs

Whenever possible, design your installation so the connector does not pass through a combustible wall. If you are considering a wall pass-through in your installation, check with your building inspector before you begin. Also, check with the chimney connector manufacturer for any specific requirements.

Accessories are available for use as wall pass-throughs. If using one of these, make sure it has been tested and listed for use as a wall pass-through.

In the United States, the National Fire Protection Association (NFPA) has established guidelines for passing chimney connectors through combustible walls. Many building code inspectors follow these guidelines when approving installations.

Figure 10 shows one NFPA-recommended method. All combustible material in the wall is cut away from the single-wall connector to provide the required 12” (305 mm) clearance. Any material used to close up the opening must be noncombustible.

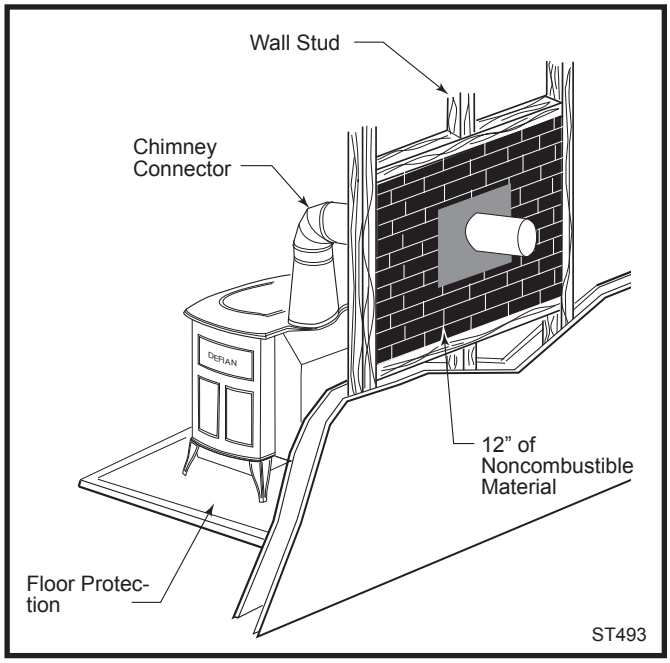


Fig. 10 An approved wall pass-through for the United States.

Three other methods are also approved by the NFPA:

- Placing a section of chimney connector inside a ventilated thimble, which in turn is separated from combustibles by 6” (152 mm) of fiberglass insulating material.
- Placing a section of chimney connector inside a section of 9” (230 mm) diameter, solid-insulated, factory-built chimney, with 2” (51 mm) of air space between the chimney section and combustibles.
- Using a section of solid-insulated double-wall high temperature chimney, with an inside diameter the same as the chimney connector, at least one inch of solid insulation, and a minimum of 9” (229 mm) air space between the outer wall of the chimney section and combustibles.

In Canada, The Canadian Standards Association has established different guidelines for wall pass-throughs. Figure 11 shows one method, in which all combustible material in the wall is cut away to provide the required 18” (457 mm) clearance for the connector. The resulting space must remain empty. A flush-mounted sheet metal cover may be used on one side only. If covers must be used on both sides, each cover must be mounted on noncombustible spacers at least 1” (25 mm) clear of the wall.

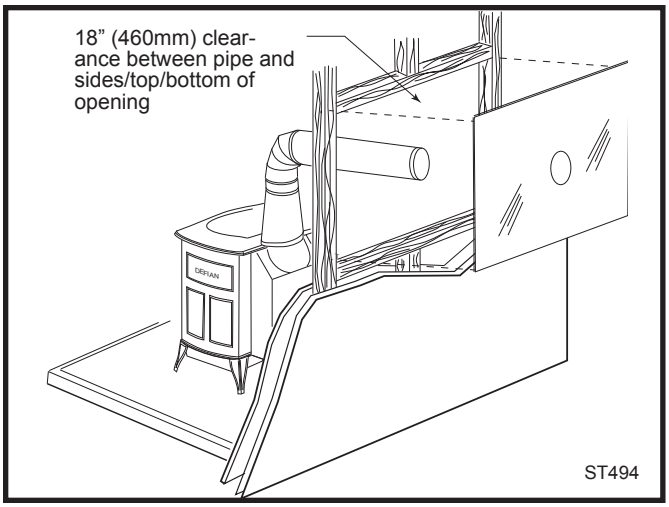


Fig. 11 An approved wall pass-through for Canada.

Your local dealer or your local building inspector can provide details for other approved methods of passing a chimney connector through a combustible wall in your area. In Canada, this type of installation must conform to CAN/CSA-B365, Installation Code for Solid Fuel Burning Appliances and Equipment.

NOTE: Do not vent your Defiant into a factory-built (zero-clearance) fireplace. These appliances and their chimneys are specifically designed as a unit for use as fireplaces. It may void the listing or be hazardous to adapt them for any other use.

DO NOT CONNECT THE DEFIANT TO ANY AIR DISTRIBUTION DUCT OR SYSTEM.

Floor Protection

A tremendous amount of heat radiates from the bottom plate of your stove. The floor area directly under and around the stove will require protection from radiant heat as well as from stray sparks or embers that may escape the firebox.

Heat protection is provided with the use of the Bottom Heat Shield supplied with the stove.

Most installations will require the bottom heat shield to be attached. Only when the stove is placed on a completely noncombustible surface such as unpainted concrete over earth may it be used without the heat shield.

Even when the bottom heat shield are installed, most installations require special thermal protection (insulation) for the floor beneath. Use an approved 1/2" (13 mm) noncombustible hearth pad with k = 0.84 BTU/in ft^2 hr °F or an equivalent material with an R-value of at least 0.59. (Refer to "How to Determine if Alternate Floor Protection Materials are Acceptable" section.) The floor protector may be covered with a decorative noncombustible material if desired. Do not obstruct the space under the heater.

When using a fire screen with doors open, UL737, Standard for Fireplace Stoves, use an approved 1" (25 mm) noncombustible hearth pad with k = 0.84 Btu/in ft^2 hr °F or an equivalent material with an R-value of at least 1.18. (Refer to "How to Determine if alternate Floor Protection Materials are Acceptable" section.) The floor protector may be covered with a decorative noncombustible material if desired. Do not obstruct the space under the heater. An 8" chimney and chimney connector is required an the bypass damper must be in the fully open position.

Important: All installations on a combustible floor require the use of the supplied bottom heat shield.

Protection requirements vary somewhat between the Untied States and Canada as follows:

In U. S. installations the floor protector is required under the stove and must extend at least 16" (not including the ash lip) from the front of the stove ("F", Fig. 12), and at least 6" from the sides and rear. ("D" and "E", Fig. 12)

In rear venting configurations, floor protection must also extend under the chimney connector and 2" to either side. ("C", Fig. 12) For the 8" (203 mm) connector, the protector must be a minimum of 12" (305 mm) wide. For the 6" (152 mm) connector, the protector must be 10" (254 mm) wide. The protector must be centered under the connector.

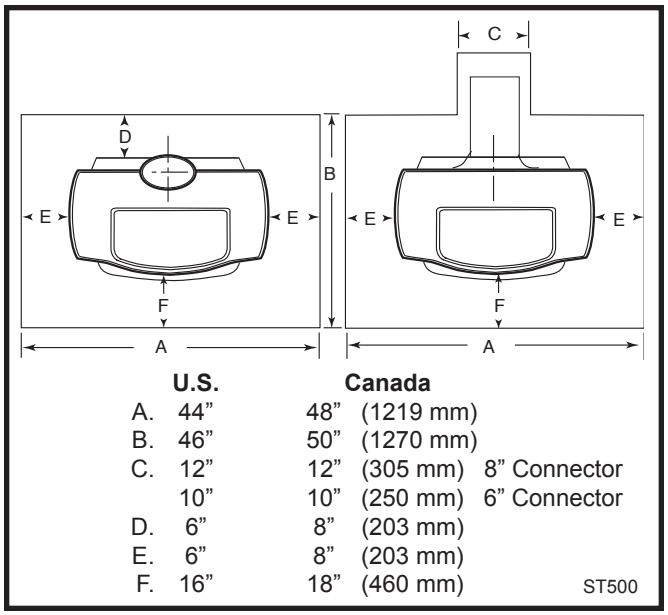
To meet these requirements, a floor protector must be at least 44" wide and 46" deep.

In Canada: A noncombustible floor protector is required under the stove as well. The floor protector must extend 18" (457 mm) to the front ("F", Fig. 12), and 8" (203 mm) from the sides and rear. ("D" and "E", Fig. 12)

To meet these requirements, a floor protector must be at least 46" (1168 mm) wide and 50" (1270 mm) deep.

How to Determine if Alternate Floor Protection Materials are Acceptable

All floor protection must be noncombustible (i.e. metals, brick, stone, mineral fiber boards, etc.). Any organic materials (i.e. plastics, wood paper products, etc.) are combustible and must not be used. The floor protection specified includes some form of thermal designation such as R-value (thermal resistance) or k-factor (thermal conductivity).



	U.S.	Canada	
A.	44”	48” (1219 mm)	
B.	46”	50” (1270 mm)	
C.	12”	12” (305 mm)	8” Connector
	10”	10” (250 mm)	6” Connector
D.	6”	8” (203 mm)	
E.	6”	8” (203 mm)	
F.	16”	18” (460 mm)	ST500

Fig. 12 Required floor protection dimensions.

Procedure:

1. Convert specifications to R-value:
   i. R-value given - no conversion needed.
   ii. k-factor is given with a required thickness (T) in inches: $R = \frac{1}{k} \times T$
   iii. K-factor is given with a required thickness (T) in inches: $R = \frac{1}{K \times 12} \times T$
   iv. r-factor is given with a required thickness (T) in inches: $R = r \times T$
2. Determine the R-value of the proposed alternate floor protector:
   i. Use the formula in Step 1 to convert values not expressed as R.
   ii. For multiple layers, add R-values of each layer to determine overall R-value.
3. If the overall R-value of the system is greater than the R-value of the specified floor protector, the alternate is acceptable.

EXAMPLE: The specified floor protector should be 1/2-inch thick material with k-factor of 0.84. The proposed alternate is 4” brick with an r-factor of 0.2 over 1/8” mineral board with a k-factor of 0.29

Step a: Use formula above to convert specification to R-value: $R = \frac{1}{k} \times T = \frac{1}{0.84} \times 0.5 = 0.59$

Step b: Calculate R of proposed system.

4” brick of r = 0.2, therefore:

$R_{brick} = 0.2 \times 4 = 0.8$

1/8” mineral board of k = 0.29, therefore

$R_{mineralboard} = \frac{1}{0.29} \times 0.125 = 0.431$

$R_{total} = R_{brick} + R_{mineralboard} = 0.8 + 0.431 = 1.231$

Step c: Compare proposed system Rtotal of 1.231 to specified R of 0.59. Since proposed system Rtotal is greater than required, the system is acceptable.

Definitions

$$R = \frac{(ft^2)(hr)(°F)}{Btu} \qquad k = \frac{(Btu)(in)}{(ft^2)(hr)(°F)} = K \times 12$$

$$K = \frac{(Btu)(ft)}{(ft^2)(hr)(°F)} \qquad r = \frac{(ft^2)(hr)(°F)}{(Btu)(in)} = \frac{1}{k}$$

Floor Protection for Fireplace Installation

Do not assume that your fireplace hearth is completely noncombustible. Many fireplace hearths do not satisfy the “completely noncombustible” requirement because the brick or concrete in front of the fireplace opening is supported by heavy wood framing. Because heat passes readily through brick or concrete, it can easily pass through to the wood. As a result, such fireplace hearths can be a fire hazard and are considered a combustible floor.

For all fireplace installations, follow the floor protection guidelines described above, including the need for a bottom shield. Keep in mind that many raised hearths will extend less than the required clearance from the front of the heater. In such cases, sufficient floor protection as described above must be added in front of the hearth to satisfy the minimum floor protector requirement from the front of the stove: 16” (410 mm) in the United States and 18” (460 mm) in Canada. Hearth rugs do not satisfy the requirement for floor protection as they are not fire proof.

Fireplace installations also have special clearance requirements to the side walls, side decorative trim and fireplace mantel. Refer to the information on fireplace and mantel trim shields in this section.

Keep the Stove a Safe Distance From Surrounding Materials

Both a stove and its chimney connector radiate heat in all directions when operating, and nearby combustible materials can overheat dangerously if they are too close to the heat source. A safe installation requires that adequate clearance be maintained between the hot stove and its connector and nearby combustibles.

Clearance is the distance between either your stove or chimney connector, and nearby walls, floors, the ceiling, and any other fixed combustible surface. The Defiant has specific clearance requirements that have been established after careful research and testing. These clearance requirements must be strictly observed.

In addition, keep furnishings and other combustible materials away from the stove. In general, a distance of 48” (1219 mm) must be maintained between the stove and moveable combustible items such as drying

clothes, furniture, newspapers, firewood, etc. Keeping those clearance areas empty assures that nearby surfaces and objects will not overheat.

Safe Ways to Reduce Clearances

Clearance requirements are established to meet every installation possibility, and they involve the combination of these variables:

- When the stove pipe has no listed heat shield mounted on it.
- When the wall has no heat shield mounted on it.
- When the wall has a heat shield mounted on it.
- When the wall and stove pipe have heat shields.

In general, the greatest clearance is required when you place a stove and its connector near a wall with no heat shield.

For example, when the Defiant is installed parallel to the rear wall and no connector shield is used, it must be at least 15” (381 mm) from the wall behind it and at least 21” (533 mm) from walls on either side. These dimensions are measured from the top edge of the stove to the combustible wall.

If the Defiant is installed in a corner and no shield is used, the corners of the stove top must be at least 5” (127 mm) from nearby walls.

Clearances may be reduced only by means approved by the regulatory authority, and in accordance with the clearances listed in this manual. Refer to Page 14 for approved clearance reduction specifications.

NOTE: A minimum ceiling height of 8’ (2.4 m) is required for all installations of the Defiant.

NOTE: Installation of the Defiant is not permitted in alcoves.

Wall Shields

One way to reduce clearances is with a wall shield constructed of 24 gauge or heavier sheet metal, or of another noncombustible material such as 1/2” (13 mm) insulation board such as Durock® or Wonderboard®, or common brick “laid on flat,” with the 3½" (90 mm) side down.

Shields must be spaced out from the combustible surface 1" (25 mm) on noncombustible spacers, as in Figure 13. The spacers should not be directly behind the stove or chimney connector.

Air must be able to flow between the wall and the shield. At least 50% of the bottom 1" (25 mm) of the shield must be open, and the shield must be open at the top. Metal screening across the top will keep small stray objects from being trapped behind the shield. (Fig. 13)

The shield must be a minimum of 48" (1219 mm) tall, and must extend at least 19" (483 mm) higher than the top of the stove, whichever is higher. The shield behind the chimney connector must be 30" (760 mm) wide, centered behind the pipe; for installations that use an approved prefabricated chimney to pass through the ceiling, the shield behind the chimney connector must stop 1" (25 mm) below the ceiling.

With 8” connections and chimneys, because of potentially higher pipe temperatures, the shield must extend the full height of the wall (up to 9’ (2.7 m)) and stop 1” (25 mm) below the ceiling.

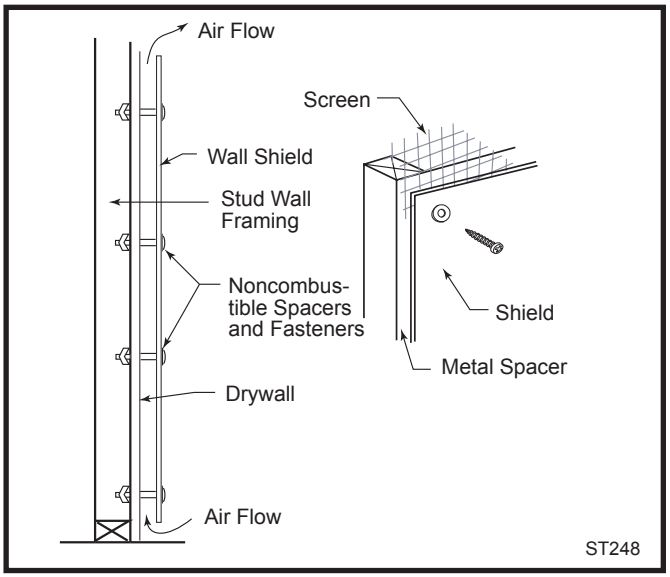


Fig. 13 Approved wall shield construction.

Fireplace and Mantel Trim Shields

A fireplace installation requires special clearance between the side of the stove and the right and left walls, between the side of the stove and the decorative side trim on the fireplace face, and between the top of the stove and the mantel.

Noncombustible shields installed 1” (25 mm) away from the combustible surface on noncombustible spacers, called ventilated shields, may be used to reduce clearances.

To protect a mantel from the heat of a stove in a fireplace installation, use a custom-made ventilated mantel shield that is at least 48” (1220 mm) long, centered over the stove. (Fig. 14) Ventilated shields for side trim must extend the full length of the trim.

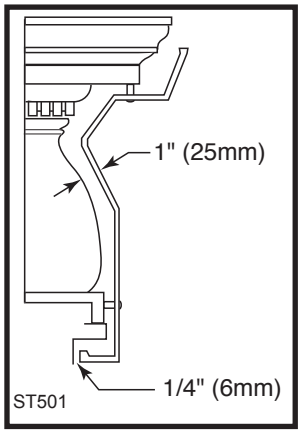


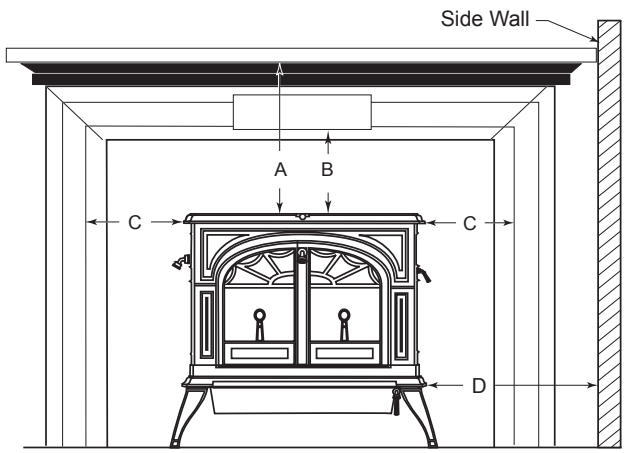
Fig. 14 A custom-formed mantel shield.

An unprotected mantel (“A”, Fig. 15) cannot be more than 9” (230 mm) deep and must have a minimum clearance of 41” (1041 mm), measured from the stove’s top plate. With a ventilated shield, this clearance may be reduced safely to 29” (737 mm).

Unprotected top trim (B) protruding 3/4” (19 mm) or less from the face of the fireplace must be a minimum of 28” (711 mm) from the stove’s top surface. With a ventilated trim shield, this clearance may be reduced safely to 21” (533 mm).

Unprotected side trim (C) that protrudes 3/4” (19 mm) or less from the face of a fireplace must have a minimum clearance of 14” (356 mm), measured from the stove’s top side edge. If the trim extends more than 3/4” (19 mm), it is subject to the requirements for wall clearance.

The charts and sample installations that follow list all the clearances required for the various installation configurations of the Defiant.



Fireplace and Mantel Trim Clearances

	Unprotected	Protected
A. Mantel	41” (1041 mm)	29” (737 mm)
B. Top Trim	28” (711 mm)	21” (533 mm)
C. Side Trim	14” (356 mm)	14” (356 mm)
D. Side Wall	21” (533 mm)	11” (280 mm)

Fig. 15 Maintain clearances to combustible components of the mantelpiece.

Defiant Clearance Chart for 6” and 8” Connections ONLY

	Stove Clearance							
	Unprotected Surface No Connector Heat Shields				**Protected Surfaces[1] with Connector Heat Shields**			
	Stove Installed Parallel to Wall			**Stove in Corner**	**Stove Installed Parallel to Wall**			**Stove in Corner**
	Side	**Rear[2]**		**Corners**	**Side**	**Rear[2]**		**Corners**
		(to rear shroud)	(to back edge of cast top)			(to rear shroud)	(to back edge of cast top)	
Top exit with single wall connector pipe	(A) 21” (521 mm)	(B) 15” (381 mm)	(C) 21” (521 mm)	(D) 5” (127 mm)	(E) 5” (127 mm)	(F) 3” (76 mm)	(G) 9” (229 mm)	(D) 5” (127 mm)
Door open with fire screen used and damper open (8” chimney only)[2]	(H) 22” (559 mm)	(I) 18” (457 mm)	(J) 24” (610 mm)	n/a	n/a	n/a	n/a	n/a
Top Exit with double wall[3] connector pipe	(P) 21” (521 mm)	(Q) 15” (381 mm)	(R) 21” (521 mm)	(S) 5” (127 mm)	(T) 5” (127 mm)	(U) 3” (76 mm)	(V) 9” (229 mm)	(W) 2” (51 mm)
Rear Exit	(X) 21” (521 mm)	(Y) 10” (254 mm)	(Z) 16” (407 mm)	n/a	n/a	n/a	n/a	n/a

The attached rear shroud must be used in all installations. The flue collar heat shield must be used in all vertical installations.

1. The connector pipe heat shield must extend 36” (914 mm) above the flue collar.
2. WARNING: If stove has been installed based on the clearances described above as “Top exit with single wall or double wall connector pipe,” then stove cannot be operated as “Door open with fire screen and damper open” without moving the stove so the clearance meets those described for this type installation.
3. Using a listed double wall oval to round connector.

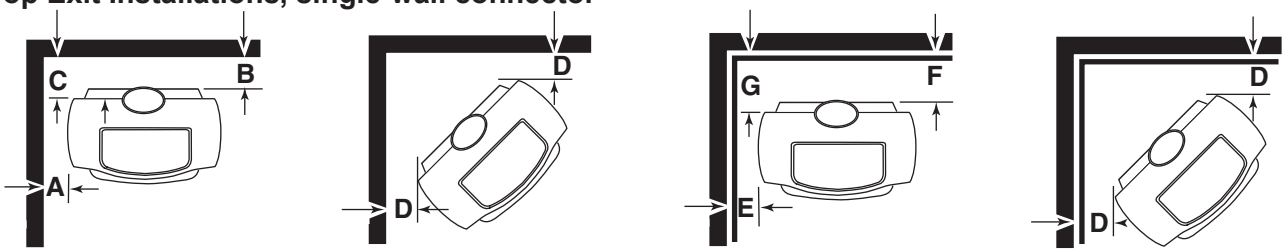
A ceiling heat shield, 24” (610 mm) in diameter and suspended 1” (25 mm) from the ceiling must surround the pipe in installations where the chimney penetrates the ceiling.

Defiant Clearance Diagrams

for use with either a 6” or 8” chimney connection

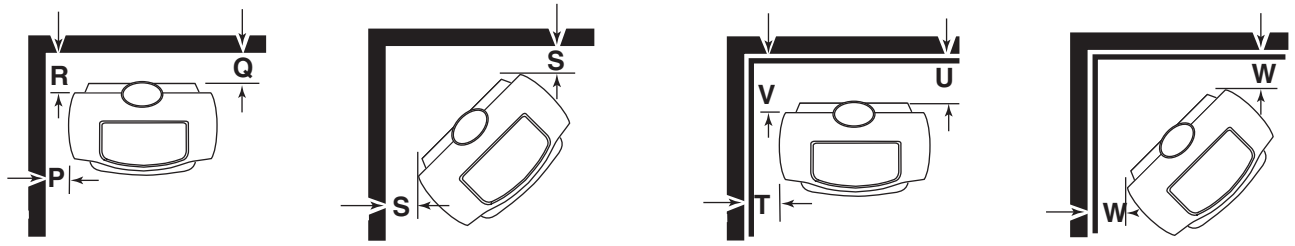
Unprotected Surfaces No Connector Heat Shield		Protected Surfaces with Connector Heat Shield	
Stove Installed Parallel to Wall	**Stove in Corner**	**Stove Installed Parallel to Wall**	**Stove in Corner**

Top Exit Installations, single-wall connector



Door open with fire screen, damper open, 8” chimney only, 1” floor protection

Top Exit Installations, double-wall chimney connector, flue collar shield installed



Rear Exit Installations

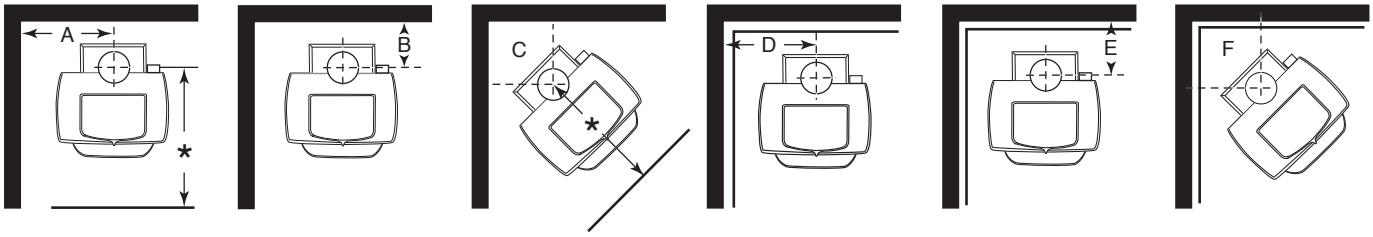
ST855

Distance from the Center of the Flue Collar to the Wall

Single Wall - No Connector Heat Shields					
Unprotected Surfaces			Protected Surfaces		
Parallel Installations		Corner Installations	Parallel Installations		Corner Installations
Side (A)	Rear (B)	Corner (C)	Side (D)	Rear (E)	Corner (F)
36½” (927 mm)	21” (533 mm)	16” (406 mm)	20½” (521 mm)	9” (229 mm)	16” (406 mm)

Doors Open - 8” Connector		
Unprotected Surfaces		
Parallel Installations		Corner Installations
Side (A)	Rear (B)	Corner (C)
37½” (953 mm)	18” (457 mm)	

Double-wall Connector					
Side (A)	Rear (B)	Corner (C)	Side (D)	Rear (E)	Corner (F)
36½” (927 mm)	21” (533 mm)	16” (406 mm)	20½” (521 mm)	9” (229 mm)	16” (406 mm)



* This distance, from the center of the flue collar to the front edge of the hearth, is the same for all installations on this page: 34” (865 mm) in the United States and 36” (914 mm) in Canada.

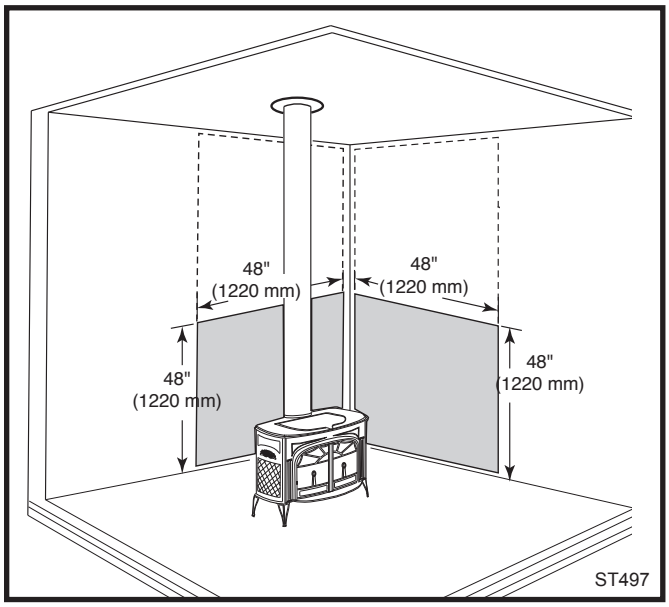


Fig. 16 Parallel installation, vertical chimney connector, two wall shields. Reduced clearances for both rear and side walls. Wall shields may meet at corner if desired. Shielding for connector is centered behind connector.

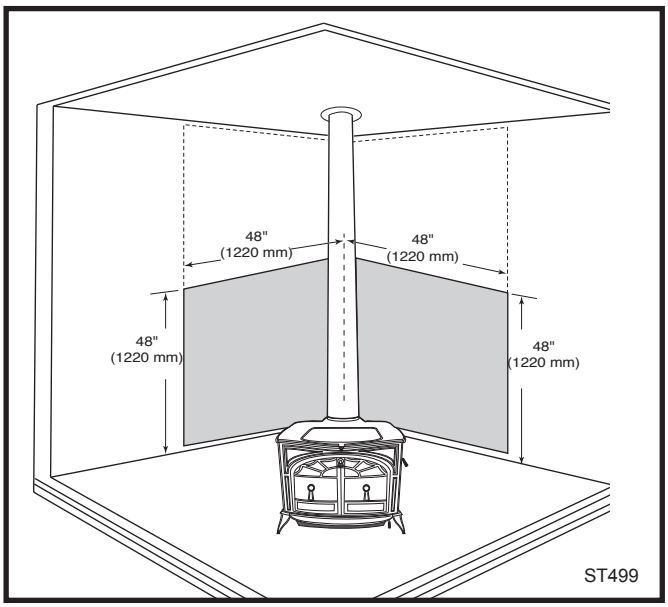


Fig. 18 Corner installation, vertical chimney connector, two wall shields. Reduced side clearances. Wall shield MUST meet at corner.

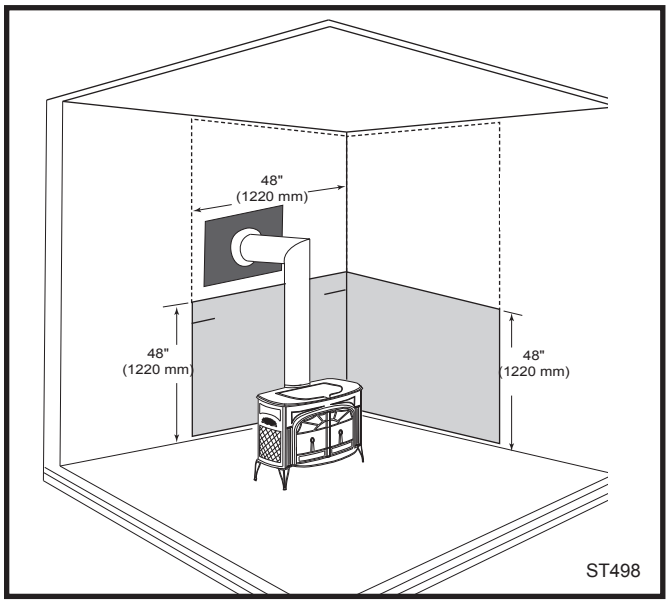


Fig. 17 Parallel installation with rear wall pass-through, two wall shields. Reduced clearances to both rear and side walls. Wall shields may meet at corner if desired. Wall pass-through must comply with codes.
Refer to “Special Installations.”

Assembly

Set Up Your Stove

Cast iron stoves are heavy, and it will take two to four people to move your Defiant into position.

Wipe the protective coating of oil from the griddle with a clean dry rag or a paper towel.

Install the handle on the griddle. First, place the griddle upside down at the edge of a flat surface and assemble the handle as shown.

With the handle pointing 45° from its final position, tighten the nut as far as possible with the pliers. Move the handle to its final position while still holding the nut with the pliers.

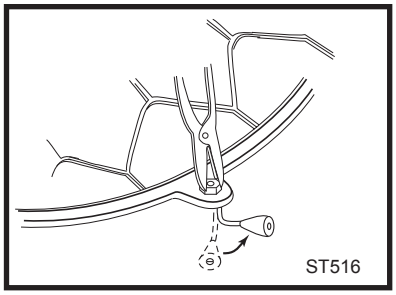


Fig. 19 Attach the griddle handle.

Install Stove Legs

The stove is shipped with the legs attached. In some instances, the legs may have been removed. Follow these instructions to reattach the legs. Install the stove legs (Fig. 21) using the hex head bolts from the parts bag. Use 3/8" washers with all four legs; the door handle holder installs on the right front leg. Position the holder so the hole to accept the handle hub faces out from the right side of the stove. Tighten the bolts firmly.

CAUTION: Overtightening can strip tapped threads.

NOTE: When moving the stove, lift the stove to take weight off the legs whenever possible. Dragging or sliding the stove, especially across rough surfaces can cause the legs to loosen or even break.

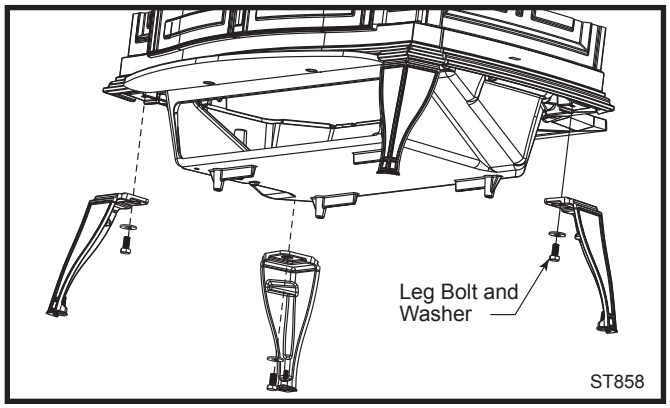


Fig. 20 Attach the stove legs.

Storing the Handle

Use the removable handle to open or close the doors. After using it, remove the handle so it will not get hot. Store the handle in the handle holder installed behind the right front leg. (Fig. 21)

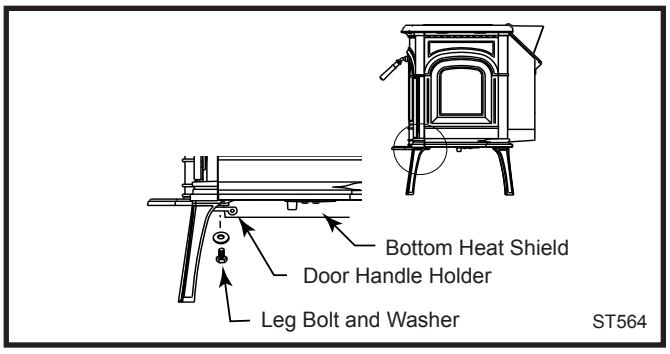


Fig. 21 Handle holder and heat shield positions.

Install the Bottom Heat Shield

NOTE: The Bottom Heat Shield is required in most installations. Refer to Floor Protection, Page 10, for further details.

1. Loosen the four 1/4-20 hex head bolts from the corners of the ash drop on the stove bottom.
2. Align the bottom heat shield holes with the four bolts. The outside air cutout hole should be toward the rear of the stove. The unpainted side must face up towards the stove.
3. Pass all four bolts through the large end of the keyholes and then pulling the shield forward to engage the smaller ends of the keyhole slots. (Fig. 22)
4. Attach the heat shield sides by passing the slots over the bolt heads. Tighten the hex head bolts.

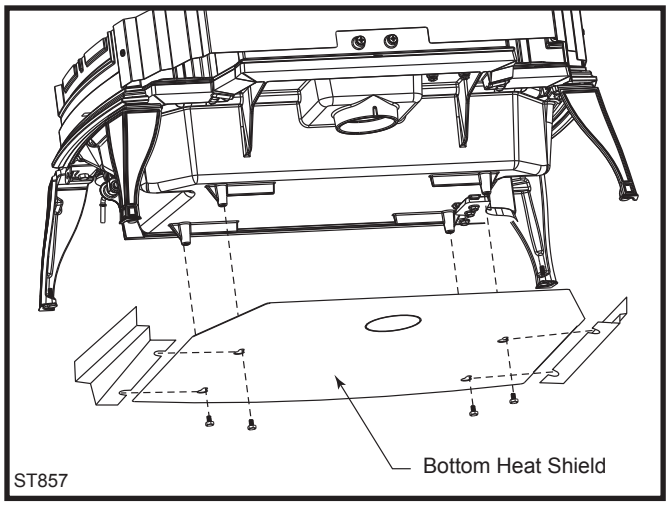


Fig. 22 Attach the bottom heat shield.

Adjust the Leg Levellers

Lift the stove slightly so there is no weight on the leg while making the adjustment.

Reverse the Flue Collar (If necessary)

Reverse the flue collar by removing the two screws that attach it to the back of the stove. Be sure the gasket around the flue collar opening is in position when you screw the collar back onto the stove.

Adjust Air Deflector

If you have the optional fan kit, you may decide to adjust the air deflector to blow heat across the top of your stove. (Fig. 24) Loosen the two (2) screws on each side and raise or lower the deflector. After adjustment, tighten the screws.

Attach Flue Collar Heat Shield

WARNING: The flue collar heat shield must be attached to the Defiant stove. Use four #10 sheet metal screws supplied to secure the flue collar heat shield to the rear of the stove. (Fig. 24)

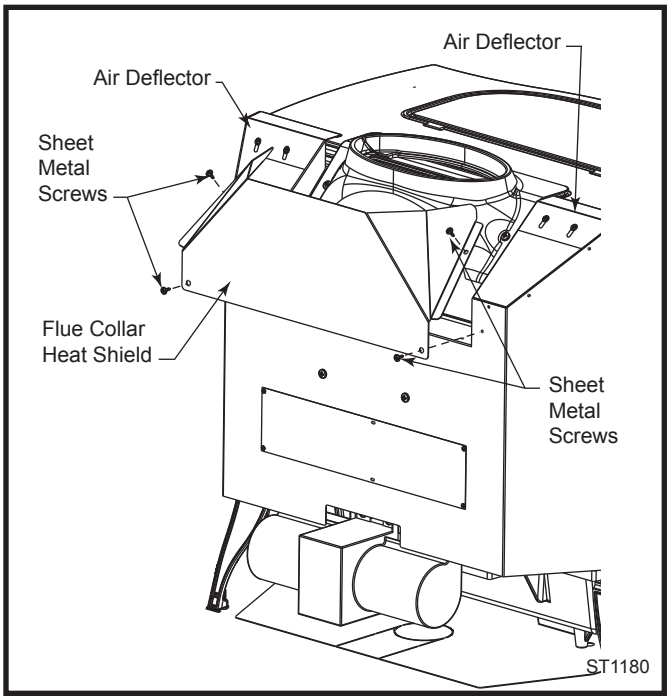


Fig. 24 Install flue collar heat shield.

WARNING: Flue collar heat shield must be installed.

Attach the Damper Handle

Use the 1/4” -20 x 3” screw to attach the damper handle to the damper stub on the left side.

Attach the Primary Air Thermostat Handle

The primary air thermostat handle is the smaller of the two black handles. Secure the handle to the stub on the right side of the stove with an 8-32 x 2” slot head machine screw. (Fig. 25)

Assemble the Removable Insert Handle

The ceramic removable insert handle opens and closes the front doors. Remove after each use, and store it in the handle holder behind the right front leg. Assemble the handle by passing the 3⅜" screw through the ceramic shaft and into the bright metal nub. (Fig. 26) Tighten carefully until snug.

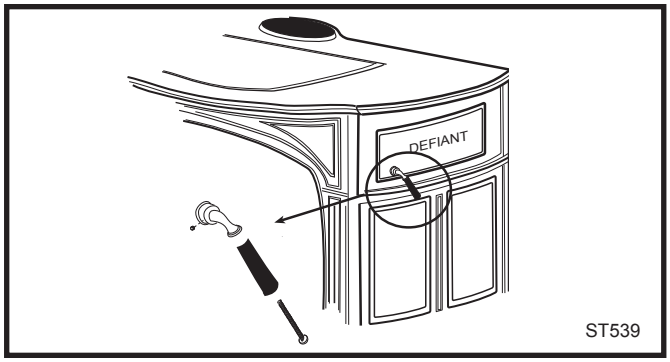


Fig. 25 Attach the thermostat handle.

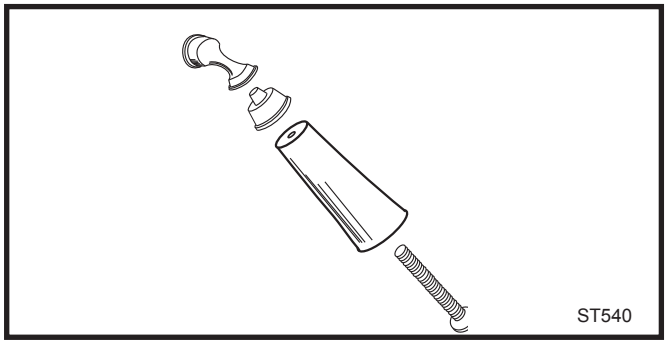


Fig. 26 Assemble the front door handle.

Fan Kit Installation

1. Attach the fan assembly at the bottom edge of the inner back with two (2) 1/4-20 x 3/4" hex head screws.
2. Attach snapstat to the mounting holes on the underside of the bottom with two (2) 1/4-20 pan head screws.
3. Attach the rheostat holder (provided with the stove) under the right front wing of the bottom heat shield with two (2) #10 sheet metal screws.
4. Attach the rheostat to its holder by inserting the rheostat control shaft through the holder hole. Install the retaining ring and rheostat knob onto the shaft.
5. Secure the rheostat cable to the underside of the bottom heat shield using the wire tie provided and the hole at the right rear edge of the heat shield.
6. Fan will not operate until stove reaches approximately 109°F.

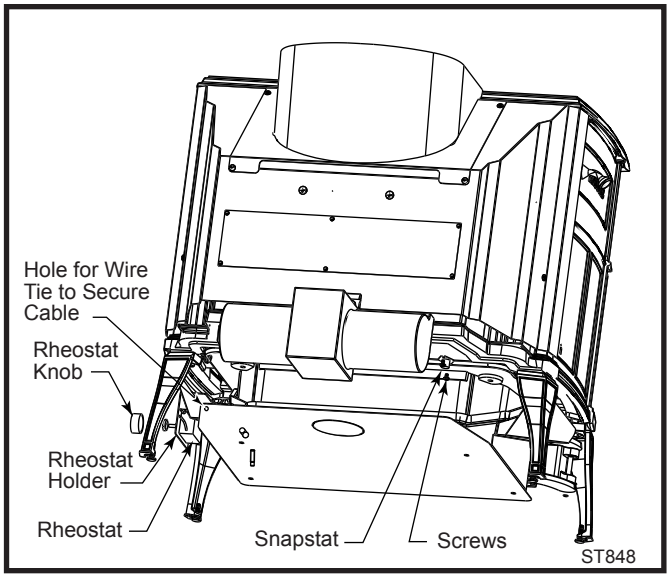


Fig. 27 Fan installation (Kit # 2767).

Installing or Removing Catalyst

1. Remove the access cover by gently lifting up and pulling out from the bottom edge. (Fig. 28)
2. Remove the inner cover by pulling it straight out. (Fig. 29)
3. Remove the catalyst by gently pulling it straight out. (Fig. 30) Place the catalyst where the catalyst's ceramic components will not be damaged.

Fig. 28 Remove access cover.

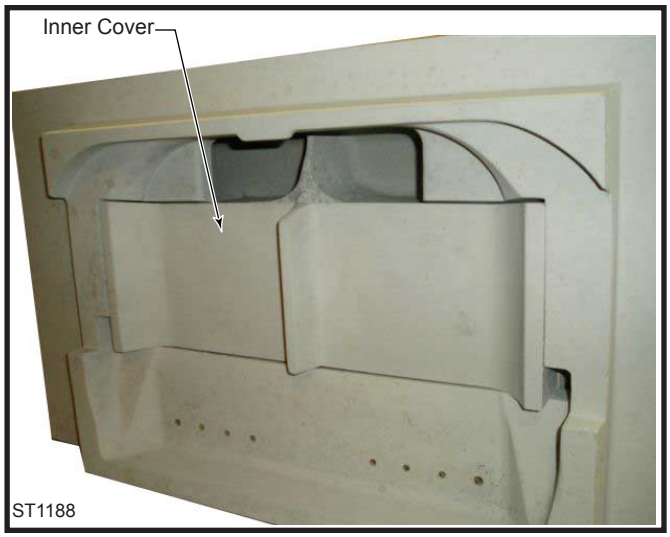


Fig. 29 Remove inner cover.

Fig. 30 Remove catalyst.

Operation

The Defiant Controls

Two controls regulate the performance of the Defiant: a **primary air control** supplies oxygen for the fire, and a **damper** directs air flow within the stove to activate and deactivate the combustion system. (Fig. 31)

Symbols cast into the stove are reminders of the correct directions for using the controls. The words 'Left' and 'right' in these directions are *facing the stove*.

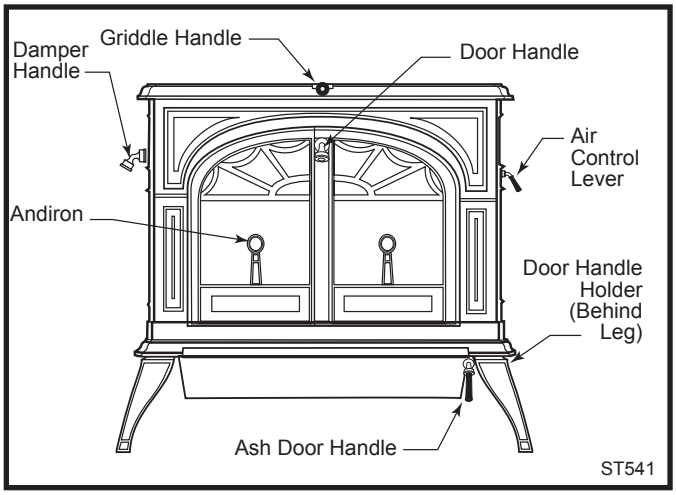


Fig. 31 The Defiant's controls are conveniently located and easy to operate.

A Single Air Control Regulates Heat Output and Burn Time

The **primary air control lever**, on the right side of the stove, controls the amount of incoming air for starting, maintaining, and reviving a fire.

More air entering the stove makes the fire burn hotter and faster, while less air prolongs the burn at a lower heat output level. (Fig. 32)

For the greatest air supply and maximum heat output (but the shortest burn time), move the lever toward the front of the stove. For a fire that will last longer with less heat, move the lever toward the rear of the stove.

A Damper Directs Air Flow Within the Stove

The **damper handle** on the left side of the stove operates the damper to direct air flow within the stove.

The damper is **open** when the handle points to the **rear**, enabling smoke to pass directly into the chimney. The damper must be open when starting or reviving a fire, and whenever the griddle or doors are opened.

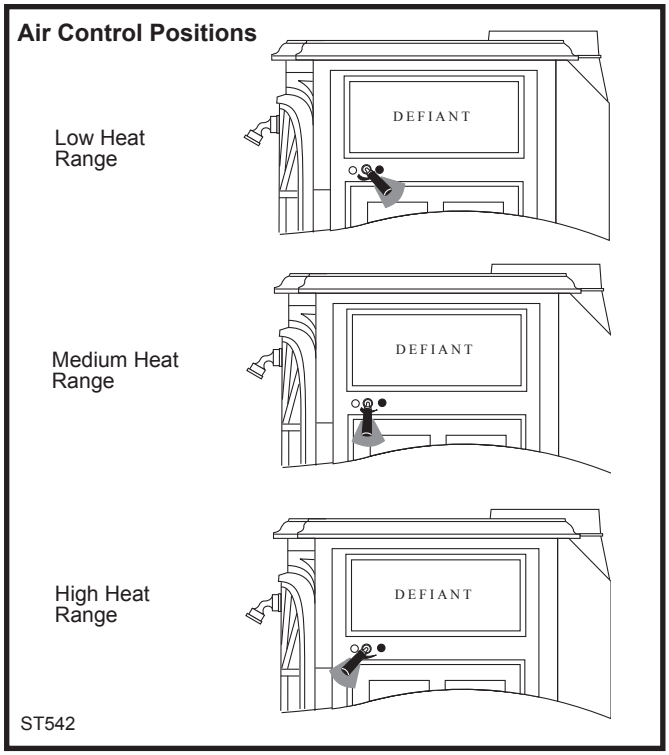


Fig. 32 The handle also may be positioned anywhere between the two extremes for different heat levels.

The damper is **closed** when the handle points **forward.** Smoke travels through the non-catalytic combustion system where it can be further burned, before passing up the chimney. (Fig. 33)

The damper should always be either fully open or fully closed. There are no intermediate positions. When closing the damper, be sure to pull firmly enough to snap the handle into the locked position.

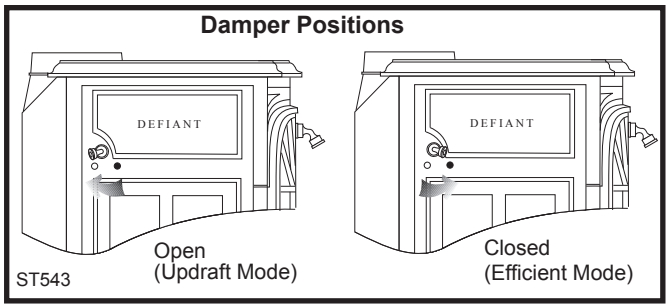


Fig. 33 The Defiant's damper operating positions.

High-Efficiency Wood Burning with Catalytic Combustion

A Defiant leaves the factory with the combustor packaged separately.

In the United States, it is against the law to operate this wood heater in a manner inconsistent with operating instructions in this manual. The components of the catalytic combustion system in your Defiant work together to produce optimum conditions for secondary combustion.

When the damper is closed, smoke travels through the catalytic element, which causes ignition of smoke at temperatures of 500°-600° F (260°-315°C), half the temperature normally required for unaided secondary combustion.

The catalytic element is a ceramic “honeycomb” coated with the catalytic material. The element is located in the secondary combustion chamber, molded from a special high-temperature insulating refractory material. The chamber provides the correct environment necessary for secondary combustion of the fuel (smoke).

Closing the damper exposes the smoke to the combustor. If the combustor is at least 600°F (315°C), it will begin to burn the smoke.

Closing the stove damper may also reduce the draft, so to avoid putting out the fire or deactivating the combustor, close the damper only when a fire is well-established and the chimney is thoroughly warmed. When starting a fire, wait until the fire is well established and there is an ember bed of at least 3-4 inches before closing the damper.

Never kindle a fire with colored paper or paper that has colored ink or a glossy surface, and never burn treated wood, garbage, solvents, or trash. All of these may poison the catalyst and prevent it from operating properly. Never burn cardboard or loose paper except for kindling purposes. Never burn coal; doing so can produce soot or large flakes of char or fly ash that can coat the combustor and cause smoke to spill into the room. Coal smoke also can poison the catalyst so that it won’t operate properly.

In general, the fire must be sufficiently well-established to ensure that catalytic activity is initiated. When first starting a fire, a medium- to high- firing rate must be maintained until the stove, catalyst, and fuel are all stabilized at the proper operating temperatures, and the chimney is warmed.

Even though it is possible for the fire to get quite hot within a few minutes after a fire is started, the combustor may stop working or the fire may go out if the fire dies down immediately as a result of the damper being closed. Once the combustor starts working, heat generated by burning the smoke will keep it working.

To determine whether the combustor is operating, observe the amount of smoke leaving the chimney when the damper is activated and when it is not. This procedure is described on Page 34.

Avoid using a full load of very dry wood in the firebox. This may result in continuous very high temperatures in the secondary combustion area and damage the combustor. Wood which has been split, and stored under cover for more than 18 months may be considered very dry. If you must burn extra-dry wood, mix it with greener wood for a longer fire and less stress on the combustor. Also, do not use a full load of dry slab wood or scrap wood. For long burns, use a mix of dry and moderately dry wood.

Two Ways to Add Fuel

The Defiant’s griddle lifts for convenient top-loading of logs, and is the easiest way to add fuel. (Fig. 34)

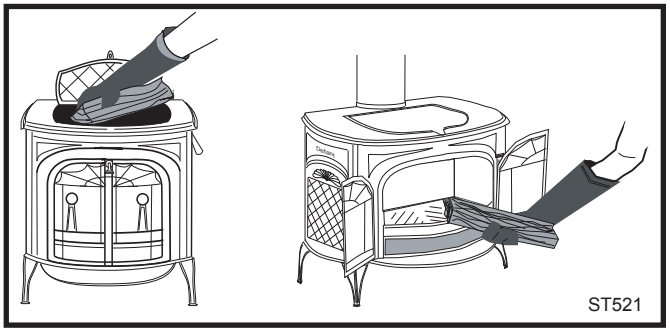


Fig. 34 Top loading is the best way to add fuel during regular use. Front loading is useful for kindling a fire.

However, the front doors open as well for adding an occasional log to a fire. If the stove is equipped with 8” (203 mm) stove pipe, the front doors may be opened (or even removed) and the optional Defiant spark screen placed in the opening for open-fire viewing. **The Defiant is not approved for operation with the front doors open if equipped with a 6” (152 mm) chimney connector or chimney.**

To open the front doors, insert the handle into the door latch stub and turn it to the left and up. (Fig. 35)

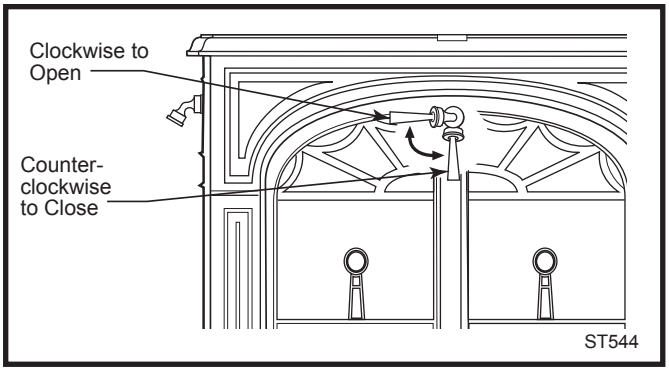


Fig. 35 To open the front doors, turn the handle clockwise.

To close them, always close the left door first. Turn the handle in the right door to the left and up (to the open position) and close it. Finally, push on the door as you turn the handle to the right and down. The doors will draw in slightly, and the handle should offer some resistance as you turn it to the closed position.

To reduce the risk of breaking the glass, avoid striking the glass or slamming the doors.

When you are not using the door handle, store it in the holder behind the right front leg of the stove. Be careful to not drop the handle, since it is breakable.

WARNING: Fireplace stoves equipped with doors should be operated only with doors fully open or doors fully closed. If doors are left partly open, gas and flame may be drawn out of the fireplace stove opening, creating risks from both fire and smoke.

WARNING: For safety and greatest efficiency, operate your stove only with all doors/griddles fully closed. The test standard for your stove when it is operated in this mode is UL 1482.

The Defiant may be used as a fireplace with the front doors open or removed, BUT only when it is equipped with 8" (203 mm) stove pipe and only when the optional spark screen is secured correctly in the opening to protect against the possibility of sparks and embers leaving the stove. The test standard for your stove when it is operated in this mode is UL 737. 1" floor protection is also required. Refer to "Floor Protection" section on Pages 10 - 11.

Use only the Defiant spark screen, Item #1907, with your Defiant.

Defiant spark screens are available from your Vermont Castings Dealer.

Andirons Help Protect the Glass

Your stove has andirons to keep logs away from the glass panels. The andirons are essential to maintain clear fire viewing, and should be left permanently in place. Since the andirons may slightly hinder refueling through the front doors, most stove owners will prefer the convenience of top loading through the griddle. Do not place fuel between the andirons and the doors.

Burn Only High-Quality Wood

The Defiant is designed to burn natural wood only; do not burn fuels other than that for which it was designed.

You'll enjoy the best results when burning wood that has been adequately air-dried. The wood should be 22-24" (559-610 mm) in length. Avoid burning "green" wood that has not been properly seasoned. **Do not burn construction materials;** they often contain chemicals and metals that can damage the inside surfaces of the stove and pollute the air. Do not burn ocean driftwood; when it burns, the salt it contains will attack the cast iron.

The best hardwood fuels include oak, maple, beech, ash, and hickory that has been split, stacked, and air-dried outside under cover for at least one year.

If hardwood is not available, you can burn softwoods that include tamarack, yellow pine, white pine, Eastern red cedar, fir, and redwood. These should also be properly dried.

Store wood under cover to keep it dry. The longer it is stored, the better heating and fire-viewing performance you will enjoy. Even for short-term storage, be sure to keep wood a safe distance from the heater and keep it out of the areas around the heater used for refueling and ash removal.

A Surface Thermometer is a Valuable Guide to Operation

An optional surface thermometer tells you when to adjust the air control, and when to refuel. (Fig. 36)

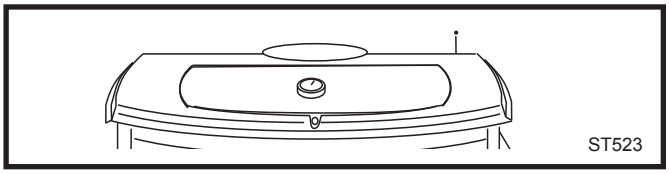


Fig. 36 Take temperature readings with a thermometer located in the middle of the griddle.

For example, when the thermometer registers at least 450°F. (230°C) after start-up you know the stove is hot enough and it may be time to close the damper. Note that the stove will warm up much sooner than the chimney, though; a warm chimney is the key to easy, effective stove operation. Please review the draft management information on Page 27 to see how the size, type, and location of your chimney will affect your stove operation. When thermometer readings drop below 350°F. (175°C) it's time to adjust the air control for a higher burn rate or to reload the stove. A temperature reading over 750°F. (385°C) is a sign to cut back on the air supply to slow the burn rate.

Use the following temperature ranges as a guide:

- Readings in the 350°-500°F. (175°-260°C) range indicate low to medium heat output.
- 500°-600°F. (260°-315°C) readings indicate medium heat output.
- Readings of 600°-750°F. (315-385°C) indicate high heat output. Operating your Defiant continuously at griddle temperatures of 750° F. (385°C) or higher may damage the cast iron or enamel finish.

Use the Air Control Settings that Work Best for You

No single air control setting will fit every situation. Each installation will differ depending on the quality of the fuel, the amount of heat desired, and how long you wish the fire to burn; outdoor air temperature and pressure also affect draft.

The control setting also depends on your particular installation's "draft," or the force that moves air from the stove up through the chimney. Draft is affected by such things as the length, type, and location of the chimney, local geography, nearby obstructions, and other factors. See Page 27 for details on how the installation affects performance.

Too much draft may cause excessive temperatures in the Defiant, and could even damage the stove. On the other hand, too little draft can cause backpuffing into the room and/or the "plugging" of the chimney.

How do you know if your draft is excessively high or low? Symptoms of too much draft include an uncontrollable burn or a glowing-red stove part. Signs of weak draft are smoke leaking into the room through the stove or chimney connector joints or low heat output.

In some newer homes that are well-insulated and weather-tight, poor draft may result from an insufficient air supply in the house. In such instances, an open window near the stove on the windward side of the house can provide the combustion air supply needed.

Another option for getting more combustion air to the stove is to duct air directly from outside to the stove. In some areas provisions for outside combustion air are required in all new construction.

The Defiant is equipped to deliver outside air for combustion and outside air kit #3265 is available.

When first using the stove, keep track of the air control settings. You will quickly find that a specific setting will give you a fixed amount of heat. It may take a week or two to determine the amount of heat and the length of

burn you should expect from various settings.

Most installations do not require a large amount of combustion air, especially if adequate draft is available. **Do not for any reason attempt to increase the firing of your heater by altering the air control adjustment range outlined in these directions.**

Use the following air control settings as a starting point to help determine the best settings for your installation. Each is described as a fraction of the total distance the lever may be moved from right to left.

Defiant Control Settings

(Refer to Figure 29, Page 19)

Burn Rate	Primary Air Control
Low	From far right to 1/3 the distance to left
Medium	From 1/3 to 2/3 the distance to left
High	From 2/3 the distance to left, to far left

DO NOT OPERATE THE STOVE WITH THE ASH DOOR OPEN. OPERATION WITH THE ASH DOOR OPEN CAN CAUSE AN OVERFIRING CONDITION TO OCCUR. OVERFIRING THE STOVE IS DANGEROUS AND CAN RESULT IN PROPERTY DAMAGE, INJURY OR LOSS OF LIFE.

Conditioning Your Stove

Cast iron is extremely strong, but it can be broken with a sharp blow from a hammer or from the thermal shock of rapid and extreme temperature change.

The cast plates expand and contract with changes in temperature. When you first begin using your Defiant, minimize thermal stress by letting the plates adjust gradually during three or four initial break-in fires following Steps 1-3 below.

Non-Catalytic Wood Burning

Burn only solid wood in the Defiant, and burn it directly on the grate. Do not elevate the fuel. Do not burn coal or other fuels.

The bypass damper must be open when starting a fire or when refueling.

Do not use chemicals or fluids to start the fire. Do not burn garbage. Never use flammable fluids such as gasoline, gasoline type lantern fuel, kerosene, charcoal lighter fluid, naptha, engine oil or similar liquids to start or "freshen up" a fire in this heater. Keep all such liquids well away from the heater while it is in use.

1. Open the stove bypass damper, and open the primary air control fully.

2. Place several sheets of crumpled newspaper in the stove. Place six or eight pieces of dry kindling split to a finger-width size on the paper. On the kindling, lay two or three larger sticks of split dry wood approximately 1-2" (25-51 mm) in diameter. (Fig. 37)

3. Light the newspaper and close the door. Gradually build up the fire by adding a few 3-5" (80-120 mm) diameter pieces of split firewood. **If this is one of the first few "break-in" fires, let the fire burn brightly, and then let it die out.**

During the break-in fires, do not let the stove get hotter than 500°F. (260°C) as measured on an optional stove-top thermometer. Adjust the air control lever as necessary to control the fire.

Some odor from the stove's hot metal and the paint is normal for the first few fires.

NOTE: Some chimneys must be "primed," or warmed up, before they will draw sufficiently to start a fire. To correct this situation, roll up a couple pieces of newspaper, place them on top of the kindling and toward the back of the stove, light them, and close the doors. This will encourage the smoke to rise rapidly, making it easier to establish a good draft.

Once the draft is established, open the front door and light the rest of the fuel from the bottom. Do not light the main bed of fuel until the chimney begins drawing,

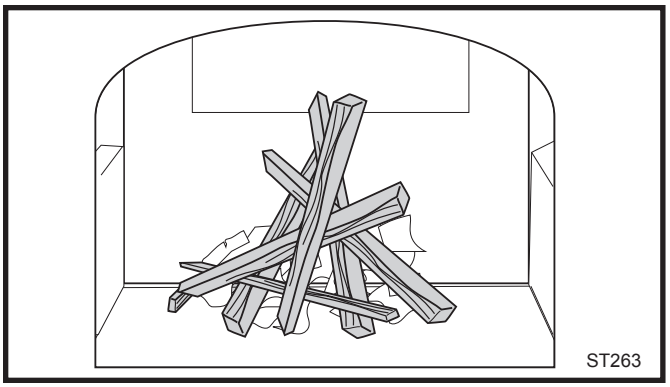


Fig. 37 Start the fire with newspaper and dry kindling.

and repeat the procedure as often as necessary if the initial attempt is unsuccessful.

4. If your Defiant has been broken-in previously using Steps 1-3, continue to build the fire gradually. Add larger wood with a diameter of 3-4" (75-100 mm). Continue adding split logs of this size to the briskly-burning fire until there is a glowing ember bed 2-3" (51-75 mm) deep. (Fig. 38) A good ember bed is necessary for proper functioning of the non-catalytic system and may take an hour or more to establish.

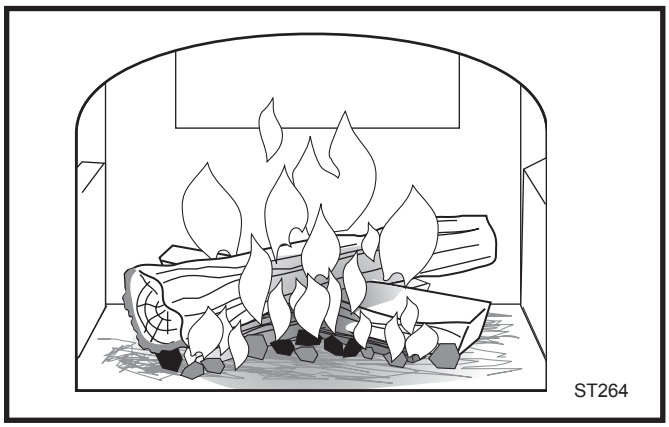


Fig. 38 Add larger pieces of wood as the fire begins to burn well.

5. Close the damper when the griddle temperature reaches 450°F (230°C).

6. Adjust the air control for your desired heat output.

NOTE: Stove installations vary widely, and the operating guidance given here is only a starting point . The draft management information on Page 27 will explain in detail how the features of your installation may help or hinder good draft, and how you may need to vary your firing technique if your installation doesn't encourage a good draft.

Refuel While the Embers Are Still Hot

When reloading, best results will be achieved if you first de-ash the stove by stirring the fuel bed to allow ash to fall through the grate into the ash pan.

Do not break the charcoal into very small pieces or pound or compress the charcoal bed.

It is important that air can circulate through the charcoal bed during the burn. Larger pieces of charcoal allow more air to circulate under the wood, resulting in the fire reviving more quickly. (Fig. 39)

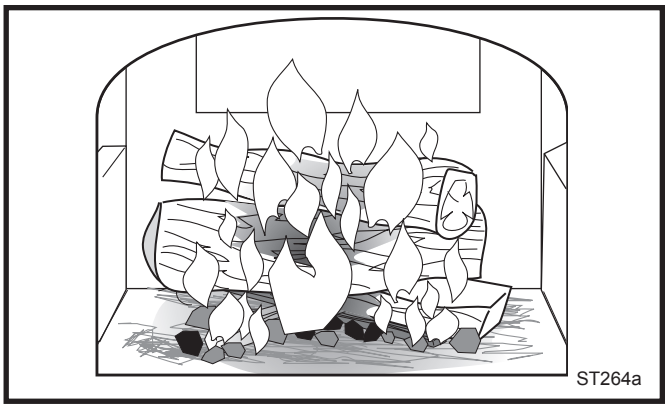


Fig. 39 Add full size logs after the ember bed is 3" (75mm) deep.

For best results when refueling, wear long-cuffed stove gloves to protect your hands and forearms, add fuel while the stove still has plenty of glowing embers to re-kindle the fire, and include some smaller pieces of wood in the new fuel load to help the stove regain its operating temperature quickly. Use this sequence as a guide to successful refueling:

1. Open the damper.
2. De-ash the stove as described above. Open the ashdoor and check the level of ash in the ash pan. Empty the pan if necessary and replace it in the stove. Close the ash door.
3. Open the griddle, load the wood (smaller pieces first), and close the griddle.
4. Close the damper.
5. When the surface temperature reaches 450°F. (230°C), adjust the air control for the amount of heat you desire.

NOTE: If the remaining charcoal bed is relatively thick (2-3"/51-75 mm) and if your fuel is well seasoned, it is possible to add fresh fuel (smaller pieces first), close the door and damper, and reset the primary air control for the desired heat output within five minutes.

WARNING: FIREPLACE STOVES EQUIPPED WITH DOORS SHOULD BE OPERATED ONLY WITH DOORS FULLY OPEN OR DOORS FULLY CLOSED. IF DOORS ARE LEFT PARTLY OPEN, GAS AND FLAME MAY BE DRAWN OUT OF THE FIREPLACE STOVE OPENING CREATING RISKS FROM BOTH FIRE AND SMOKE.

CAUTION: The Defiant will be hot while in operation. Keep children, clothing and furniture away. Contact may cause skin burns.

DO NOT OVERFIRE THIS HEATER. Overfiring may cause a house fire, or can result in permanent damage to the stove. If any part of the Defiant glows, you are overfiring.

Ash Disposal

Routine ash removal is important for ease of maintenance, and is important for the stove's durability. Remove ash before it reaches the top of the ash pan. Check the level at least once a day. Every few days, clear any ash from the outer edges of the firebox. Most of the ash will fall through the grate. Slice or stir the ash with a shovel or poker so that it falls through the grate slots.

IMPORTANT: Check the level of ash in the ash pan before reloading the stove. If the ash level is close to the top edge of the pan, empty the pan according to this procedure:

- Open the damper.
- Open the griddle or front doors, and use a shovel or poker to stir excess ash through the ash slots in the grate down into the ash pan.
- Close the griddle or doors, and unlatch the ash door. (Fig. 40) It will pivot, swinging the ash pan out of the stove.
- Slide the cover onto the pan, making sure it is securely closed. (Fig. 41)
- Remove the ash pan, making sure to keep it level.
- To keep the cover from sliding off and to keep ash from falling on the floor, do not tilt the ash pan forward.
- If the stove is in operation, close the ash door while disposing of the ash. You may need to lift the latch end of the door slightly to align the latch with the mating part on the stove bottom.
- Properly dispose of the ash in a metal container with a tight-fitting lid. Store the container outdoors away from all combustible material.
- Return the ash pan to its original position in the stove, and close and latch the ash door. (Fig. 40)
- Do not operate the stove with the ash door open. This will result in over-firing, and could cause damage to the stove, void the warranty, or even lead to a house fire.

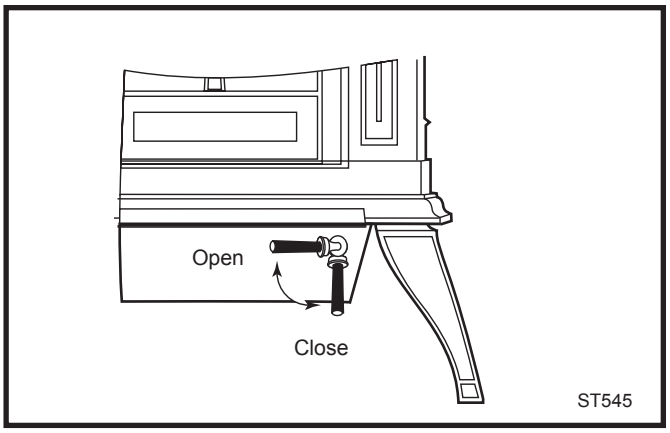


Fig. 40 Turn the ashdoor handle clockwise to open and counterclockwise to close.

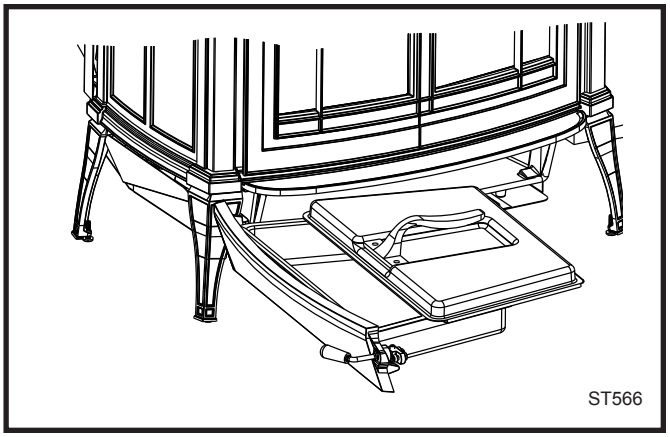


Fig. 41 Be sure the cover is securely attached before removing the ash pan.

Empty the ash pan regularly, typically every one to three days. The frequency will vary depending on how you operate your Defiant: ash will accumulate faster at higher heat outputs.

Remove ash frequently and place it outdoors in a metal container with a tight-fitting lid. Place the closed container of ash on a noncombustible floor or on the ground, well away from all combustible materials, pending final disposal. If the ash is disposed of by burial in soil or otherwise locally dispersed, it should be kept in the closed container until all cinders have thoroughly cooled.

You can use wood ash as a garden fertilizer.

CAUTION: Never use your household or shop vacuum cleaner to remove ash from the stove; always remove and dispose of the ash properly.

Draft Management

A stove is part of a system, which includes the chimney, the operator, the fuel, and the home. The other parts of the system will affect how well the stove works. When there is a good match between all the parts, the system works well.

Wood stove or insert operation depends on natural (unforced) draft. Natural draft occurs when the exhaust is hotter (and therefore lighter) than the outdoor air at the top of the chimney. The bigger the temperature difference, the stronger the draft. As the hot gases rise through the chimney they provide suction or 'draw' that pulls air into the stove for combustion. A slow, lazy fire with the stove's air inlets fully open indicates a weak draft. A brisk fire, supported only by air entering the stove through the normal inlets, indicates a good draft. The stove's air inlets are passive; they regulate how much air can enter the stove, but they don't move air into it.

Depending on the features of your installation - steel or masonry chimney, inside or outside the house, matched to the stove's outlet or oversized - your system may warm up quickly, or it may take a while to warm up and operate well. With an 'airtight' stove, one which restricts the amount of air getting into the firebox, the chimney must keep the stove's exhaust warm all the way to the outdoors in order for the stove to work well. Some chimneys do this better than others. Here's a list of features and their effects.

Masonry Chimney

Masonry is a traditional material for chimneys, but it can perform poorly when it serves an 'airtight' stove. Masonry is a very effective 'heat sink' - it absorbs a lot of heat. It can cool the chimney gases enough to diminish draft. The bigger the chimney, the longer it takes to warm up. It's often very difficult to warm up an outdoor masonry chimney, especially an oversized one, and keep it warm enough to maintain an adequate draft.

Steel Chimney

Most factory-made steel chimneys have a layer of insulation around the inner flue. This insulation keeps the chimney warm. The insulation is less dense than masonry, so a steel chimney warms up more quickly than a masonry chimney. Steel doesn't have the good looks of masonry, but it performs much better.

Indoor/Outdoor Location

Because the chimney must keep the smoke warm, it's best to locate it inside the house. This uses the house as insulation for the flue and allows some heat release into the home. An indoor chimney won't lose its heat to the outdoors, so it takes less heat from the stove to heat it up and keep it warm.

Chimney Height

The common wisdom tells us that a taller flue draws better than a short one. This isn't necessarily so. If a chimney is tall enough to meet the safety requirements of the 2/3/10 foot rule, then adding more height isn't the right answer to a draft problem. In fact it could make the problem worse by adding more mass to the chimney system, which must be warmed up, a distance from the heat source (the stove). Don't make a chimney taller unless you must in order to meet the safety rules, or unless there's some nearby feature causing a downdraft. Even then, there are downdraft-preventing chimney caps available, which are probably the smarter choice.

Flue Sizing

The inside size of a chimney for an 'airtight' stove should match the size of the stove's flue outlet. When a chimney serves an airtight stove, more is not better; in fact, it can be a disadvantage. Hot gases lose heat faster as they travel slower through a chimney; if we vent a stove with a six-inch flue collar (28 square inch area) into a 10 x 10" flue, the gases slow to one third their original speed. This allows the gases to cool more rapids, which weakens draft strength. If an oversized flue is also outside the house, the heat it absorbs gets transferred to the outdoor air and the flue usually stays cool.

It is common for a masonry flue, especially one serving a fireplace, to be oversized for the stove. It can take quite a while to warm up such a flue, and the results can be disappointing. The best solution to an oversized flue is an insulated steel chimney liner, the same diameter as the stove or insert's flue outlet; the liner keeps the exhaust warm, and the result is a stronger draft. An non-insulated liner is a second choice - the liner keeps the exhaust restricted to its original size, but the hot gases still must warm up the air around the liner. This makes the warm-up process take longer.

Pipe & Chimney Layout

Every turn the exhaust must take as it travels to the chimney top will slow it down. The ideal pipe and chimney layout is to vent vertically into a completely straight and vertical chimney. If you are starting from scratch, use this layout if possible. If the stovepipe must elbow to enter a chimney, locate the thimble about midway between the stove top and the ceiling. This achieves several goals: it allows the gases to speed up before they must turn, it leaves some pipe in the room for heat

transfer, and it gives you long-term flexibility for installing a different stove without relocating the thimble. There should be no more than eight feet of single-wall stove pipe between the stove and a chimney; longer runs can cool the exhaust enough to cause draft and creosote problems. With prefabricated chimney, bring it down to six to eight feet from the stove. With a masonry chimney, arrange the pipe so that it turns into the chimney within eight feet of the stove.

Single Venting

Each 'airtight' stove requires its own flue. If an airtight stove is vented to a flue that also serves an open fireplace, or a leakier stove, it's easier for the chimney draft to pull air in through those channels and performance of the stove suffers. Imagine a vacuum cleaner with a hole in the hose to understand the effect here. In some cases the other appliance can even cause a negative draft through the stove, and result in a dangerous draft reversal.

Creosote

Creosote is a by-product of slow wood-burning. It's an organic tar that can condense in the flue if it is present in the exhaust, slow-moving, and cools to less than 290°F (130°C). Condensed creosote is volatile, and can generate chimney fires if it gets hot enough. All the features that affect chimney draft also affect creosote condensation - so use whatever combination of installation features and operational steps that will encourage good draft and minimize creosote production.

Because letting the exhaust cool off and slow down is one of the keys to creosote accumulation, it makes sense to line a chimney to match the stove's outlet size, for safety reasons as well as performance. Canadian law requires a matching liner to serve any stove or insert vented through a fireplace chimney; in the US, the National Fire Protection Association (NFPA) recommends a chimney liner if the flue is more than three times bigger (in square area) than the outlet on the stove or insert. Some localities enforce the NFPA guidelines as part of their building codes.

Fuel

Even the best stove installation will not perform well with poor fuel. The best fuel is hardwood that has air-dried 12-18 months. Softwood burns, but not as long as hardwood. 'Green' wood has a lot of moisture in it; it will burn, but some of the heat potential is used to boil the extra moisture from the wood. This reduces the amount of heat that reaches your home and can contribute to a creosote problem. There are moisture meters available for firewood; you can also judge your wood by its appearance and weight. If you get it green, lift a piece and get a sense of its weight; it can lose a third or more of its weight as it dries. Also look at the ends of a log; as it dries it shrinks and often cracks. The more weathered and cracked a piece is, the drier it is.

Dry wood burns readily with a good chimney draft. But with modern stoves, wood can be too dry and too volatile. Smoke and combustible gases can 'gas out' from the wood quickly and densely enough to overload the combustion system. If you hear a rumbling or roaring noise (like a propane torch) from the stove, that is a sign that the stove is overfiring.

Back-puffing

Back-puffing results when the fire produces volatile gases faster than the chimney draft pulls them out of the firebox. The gases back up in the firebox until they are concentrated enough and hot enough to ignite. If your stove back-puffs, the stove needs to cool down. You should open the damper to let the smoke rise to the flue more quickly, allow more air into the firebox, avoid big loads of firewood and check that the wood moisture is not too low.

Draft Testing

An easy way to test your chimney draft is to close the stove's damper, wait a few minutes to let the airflow stabilize, then see whether you can vary the strength of the fire by swinging the air control open and closed. Results are not always instant; you may need to wait a few minutes for a change in the air control setting to have an effect on the fire. If there's no change, then the draft isn't strong enough yet to let you close the damper, and you'll need to open it for awhile longer and manage the fire with the air inlet until the draft strengthens. If you keep track of your burning habits and relate them to their effects on the stove's operation, you'll be rewarded with good performance and a safe system.

Negative Pressure

Good draft also depends on a supply of air to the stove; a chimney can't pull in more air than is available to it. Sluggish draft results when a house is tight enough to prevent the ready flow of air to the stove, or by competition between the stove and other equipment that sends indoor air outside - especially power-driven equipment like range hoods, clothes dryers, etc. If the chimney draws well with all other equipment turned off (or sealed, in the case of fireplaces and/or other stoves), then you simply need to be careful with timing the use of the other air consuming equipment. If you need to crack a nearby window or door to enable the chimney to flow well, it may be a good idea to install an outside-air intake to bring combustion air directly to the stove. An outside air kit is available to connect the stove directly to a source of outdoor combustion air.

Conclusion

Wood-burning is an art rather than a science. Once the stove and chimney system are in place, you can only vary your technique, mostly your timing, to achieve good results. If you keep track of your burning habits and relate them to their effects on the stove's operation, you'll be rewarded with good performance and year of reliable heating.

Maintenance

Keep Your Stove Looking New and Working Its Best

Let the fire in the stove go out and allow the stove to cool completely before beginning any maintenance procedure.

Care of the Cast Iron Surface

An occasional dusting with a dry rag will keep the painted cast iron of your Defiant looking new.

The stove's paint can be touched up as needed. First, mask the areas, such as enamelled parts, glass, or handles, around the spot to be painted. Clean the spot with a wire brush. Remove the griddle and set it aside. It is normal for the griddle to darken after use. You can clean it with a fine-bristle wire brush, or steel wool.

Then, touch up the stove with Vermont Castings' high temperature stove paint. Apply the paint sparingly; two light coats of paint are better than a single heavy one.

Care of the Porcelain Enamel Surface

Use a dry or slightly damp rag or soft brush to remove spills or stains. For difficult jobs that require a cleaning agent, use only a kitchen appliance cleaner or polish recommended for use on enamel surfaces.

If porcelain enamel becomes chipped or scratched during use, apply "enamel epoxy" to the damaged area and allow to dry. Once the epoxy has dried, sand the area to blend with surrounding area and apply appropriate color touch-up paint. Allow to dry completely before operating stove.

Cleaning the Glass

Most of the carbon deposits on the glass will burn off during hot fires.

However, the ash residue that accumulates on the glass surface should be removed regularly to prevent etching. To clean the glass, follow this procedure:

- Be sure the glass is completely cool.
- Clean the glass with water or a cleaner made especially for this purpose. Do not use abrasive cleaners. Use cleaning agents sparingly and be sure to keep them off the outer surfaces of the stove.
- Rinse the glass thoroughly.
- Dry the glass completely.

Replace Broken Glass Immediately

Do not operate your stove if the glass in the doors is damaged.

If you need to replace the glass, use only the high temperature ceramic glass supplied by Vermont Castings.

Do not use substitutes.

Removing the Glass

1. Remove the right and left door assemblies by raising the door until the lower hinge pin clears its hole; then, angle the door bottom slightly outward and pull down to release the upper hinge pin. Place the doors face down on a padded work surface. Be especially careful with enamelled doors.
2. Remove the screws that hold the glass retainer clips in place, and remove the clips.
3. Carefully lift the broken glass panel from the door.

Installing the Glass

Check the gasket around the window; it should be soft and resilient so that the glass will seal properly against the door. Replace the gasket if it has hardened or if it is compressed.

1. Center the glass on the gasket.
2. Secure the glass on both doors with the retainer clips. Tighten all screws. (Fig. 42)
3. Replace the doors on the stove.
4. Open and close the doors to check that they fit and work properly. Adjust as necessary.

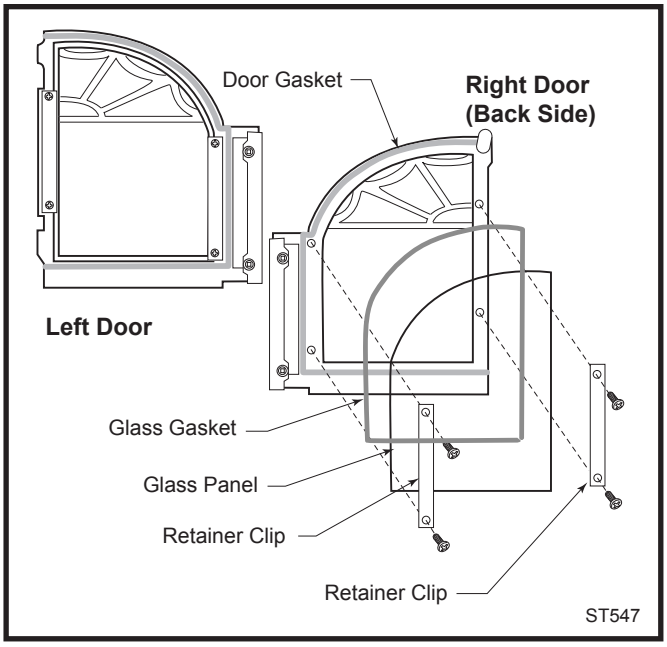


Fig. 42 An exploded view of the glass assembly.

Adjust the Damper as Needed

The tension on the Defiant's damper is adjustable to compensate for compression of the gasket that seals the damper to the upper fireback. To adjust the damper:

1. Remove the griddle. Loosen the lock nut at the center of the damper. (Fig. 43)
2. Turn the pressure screw approximately one half turn clockwise with an Allen wrench provided with your stove.
3. Tighten the lock nut. Prevent the pressure screw from turning as you tighten the nut. Re-test the damper.

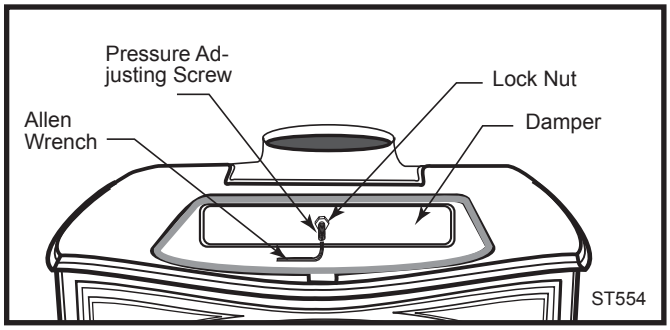


Fig. 43 Adjust the damper with the Allen wrench.

Tighten the Damper Handle as Needed

A handle on the left side of the stove controls the damper. The handle attaches to the damper rod with a set screw. Periodically check the set screw and tighten as necessary.

How to Adjust the Door Latches

The front door of the stove should close securely to prevent accidental opening and should close tightly to prevent air from leaking into the fire chamber. The door handle will be positioned vertically when the door is closed.

Over a period of time, the gasket around the door will compress and the latch may need adjustment. To adjust the handle, follow this procedure:

1. Remove and retain the lock nut with a 9/16" wrench. (Fig. 44)
2. Loosen the set screw with a 1/8" Allen wrench.
3. Rotate the pawl 180°. Replace the lock nut. Tighten the set screw.
4. Additional adjustment can be made by removing the flat washer. Or any combination of washer removal and/or pawl rotation.

Test the door seal. Close the door on a dollar bill and attempt to pull it free. If the bill is freed with little resistance, the gasket isn't snug enough at that spot. Continue to make small adjustments until the setting is right.

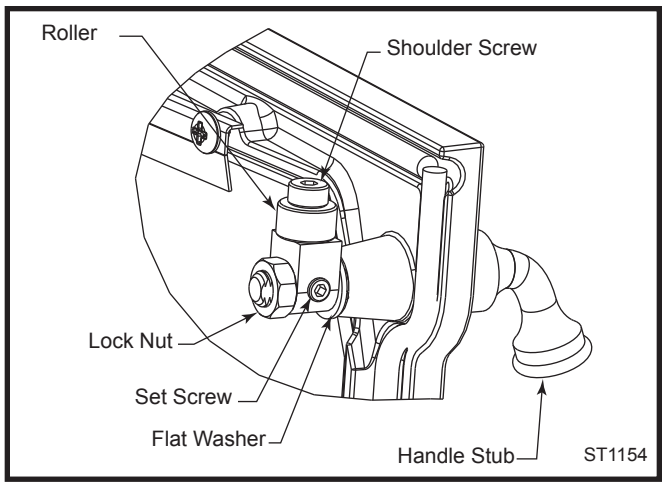


Fig. 44 Rotate pawl and/or remove flat washer to adjust latch.

If additional adjusting of the latch does not enable the door to seal sufficiently in one area, try "adjusting" the gasket in that area. Pack more cement or a smaller diameter gasket into the channel beneath the gasket so the main gasket is raised and makes contact with the door frame. If this procedure doesn't solve the problem, replace the gasket. Instructions for gasket replacement are given later in this section.

Replace the Stove Gaskets as Needed

Your Defiant uses fiberglass rope gaskets to make a tight seal between some parts. With use, particularly on moving parts, gaskets can become brittle and compressed and can begin to lose their effectiveness. These will need periodic replacement.

The sizes of replaceable gasket are listed below, along with their applications.

Gasket Diameter...	...And the Parts it Seals
5/16"	The griddle to the stove top (wire reinforced gasket)
5/16"	The damper to the upper fireback
7/16	the front doors to the stove front; and the doors to each other.
3/8"	The ash door to the front of the bottom panel
3/16"	The outer glass panes to the door

If you need to change a gasket, first obtain an appropriate replacement from your Vermont Castings' Authorized Dealer.

Wait until the fire is out and the stove has cooled. Be sure to follow the standard safety procedure for working with dusty materials: wear safety goggles and a dust mask.

The procedure for replacing gaskets is the same, regardless of the gasket location. Follow these steps:

1. Remove the existing gasket by grasping an end and pulling firmly. (Fig. 45)

2. Use a wire brush or the tip of a screwdriver to clean the channel of any remaining cement or bits of gasket. Remove stubborn deposits of cement with a cold chisel if necessary. (Fig. 45)

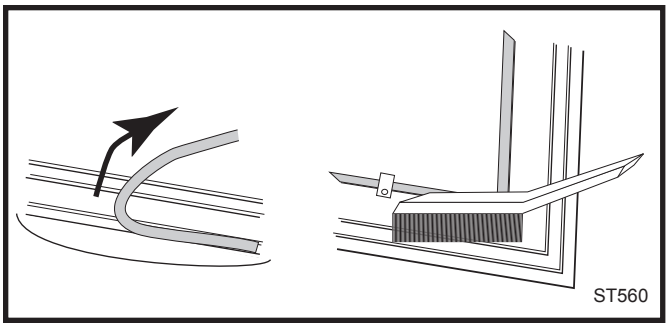


Fig. 45 Remove gasket then clean channel with wire brush.

3. Determine the correct length of the appropriate-sized gasket by laying it out in the channel. Allow an extra 1-2" (25-50 mm), and mark the spot to be cut.

4. Remove the gasket from the channel, place it on a wood cutting surface, and cut it at the marked spot with a utility knife.

Twist the ends slightly to keep the gasket from unraveling.

5. Lay an unbroken 1/8" (3 mm) bead of silicone in the newly-cleaned channel. (Fig. 46)

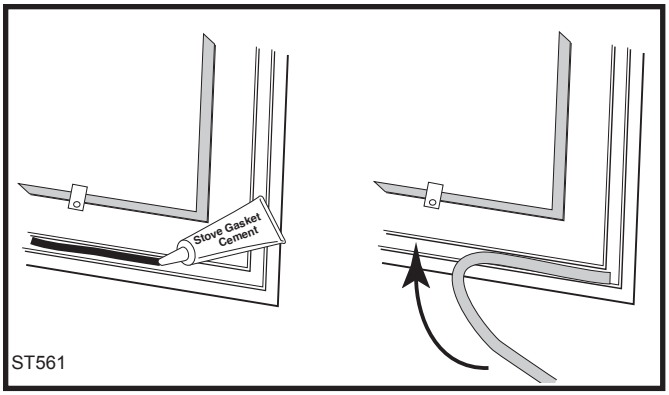


Fig. 46 Lay a bead of gasket cement then press gasket in place.

6. Starting at one end, press the gasket into the channel. (Fig. 46) Ensure a good joint where the gasket meets before trimming any excess. Do not overlap the gasket ends or leave ends with ragged edges.

7. Press the gasketed part firmly against its normal mating surface to seat the gasket evenly in its channel. Close and latch the door to do this, or tap other parts with the rubber mallet (or hammer/block of wood).

8. Clean any excess cement from around the channel, then let the cement that holds the new gasket dry thoroughly.

9. The stove's doors may need adjustment after you have regasketed them. Initially, it may require loosening the latch to accommodate the new gasket; after a few weeks, it may need tightening to compensate for compression of the new gasket. The directions for adjusting the latches are on Page 30.

All Gasketed Construction Gaskets

Other gaskets form seals between all other non-moving parts, but these are not subject to the same wear and deterioration as gaskets on moving parts. It is unlikely that you will ever need to replace these gaskets unless the involved parts are disassembled and then put back together. If this is the case, the job should be done only by a qualified service technician.
5/16" diameter gasket seals the following parts:

- The lower fireback to the back panel
- The left and right air plates (inner sides)
- All connections between the stove plates.

The Chimney System

Creosote

Your Defiant is designed to reduce creosote build-up significantly. However, regular chimney inspection and maintenance must still be performed. For safety, good stove performance, and to protect your chimney and chimney connector, inspect your chimney and chimney connector on a regular schedule. Clean the system if necessary. Failure to keep the chimney and connector system clean can result in a serious chimney fire.

When wood is burned slowly, it produces tar, organic vapors and moisture that combine to form creosote. The creosote vapors condense in the relatively cool chimney flue of a slow-burning fire. As a result, creosote residue accumulates on the flue lining. When ignited, this creosote makes an extremely hot fire within the flue system that can damage the chimney and overheat adjacent combustible material. If a significant layer of creosote has accumulated —1/8" (3 mm) or more — it should be removed to reduce the risk of a chimney fire.

You can never be too safe. Contact your local fire authority for information on what to do in the event of a chimney fire, and have a clearly understood plan on how to handle one.

If you do experience a chimney fire, act promptly to:

- Close the damper and air control lever.
- Get everyone out of the house.
- Call the Fire Department.

Inspect the system every two weeks during the heating season as part of a regular maintenance schedule. To inspect the chimney, let the stove cool completely. Then, using a mirror and a strong light, sight up through the flue collar into the chimney flue. If you cannot inspect the flue system in this fashion, the stove must be disconnected to provide better viewing access.

Clean the chimney using a brush the same size and shape as the flue liner. Flexible fiberglass rods are used to run the brush up and down the liner, causing any deposits to fall to the bottom of the chimney where they can be removed through the clean-out door.

Clean the chimney connector by disconnecting the sections, taking them outside, and removing any deposits with a stiff wire brush. Reinstall the connector sections after cleaning, being sure to secure the joints between individual sections with sheet metal screws.

If you cannot inspect or clean the chimney yourself, contact your local Vermont Castings dealer or a professional chimney sweep.

Maintenance Schedule

The Stove

DAILY:

- Clear any ash build-up from around the air holes and combustion flow path in the lower fireback.
- Ashes should be removed before they reach the top of the ash pan. Check accumulation at least once a day.
- Keep the area around the stove clear of any combustible materials such as wood, furniture or clothing.

TWO MONTHS:

- Check door handle to be sure it is working properly. Gasketing becomes compressed after a period of time. Adjust handle tightness if necessary.
- Check leg bolts and heat shield screws; tighten if necessary.

ANNUAL SPRING CLEANING:

- Check gasketing for wear, and replace if necessary.
- Remove ashes from the ash pan and replace with a moisture absorbing material (such as kitty litter) to keep the interior of the stove dry.
- Clean the dust from the inner sides of bottom, rear or pipe heat shields if your stove is equipped with them. Clean surfaces are better heat reflectors than dirty surfaces.
- Touch up the black paint.
- Inspect for and remove ash build-up behind the combustion package. This should be done in conjunction with annual cleaning of the chimney connector. Inspect the passage behind the combustion package (a mirror will be helpful) and vacuum away ash using a flexible vacuum hose inserted the passage. (Fig. 44)

The Chimney Connector

TWO WEEKS:

- Inspect the chimney connector and chimney. Clean if necessary.

TWO MONTHS:

- Inspect the chimney and chimney connector. Pay particular attention to the horizontal runs of chimney connector, and the elbows. Clean the system if necessary.

ANNUAL SPRING CLEANING:

- Disassemble the chimney connector and take it outdoors for inspection and cleaning. Replace weak sections of connector.
- Inspect the chimney for signs of deterioration. Repairs to a masonry chimney should be made by a professional mason. Replace damaged sections of prefabricated chimney. Your local Vermont Castings dealer or a chimney sweep can help determine when replacement is necessary.
- Thoroughly clean the chimney.

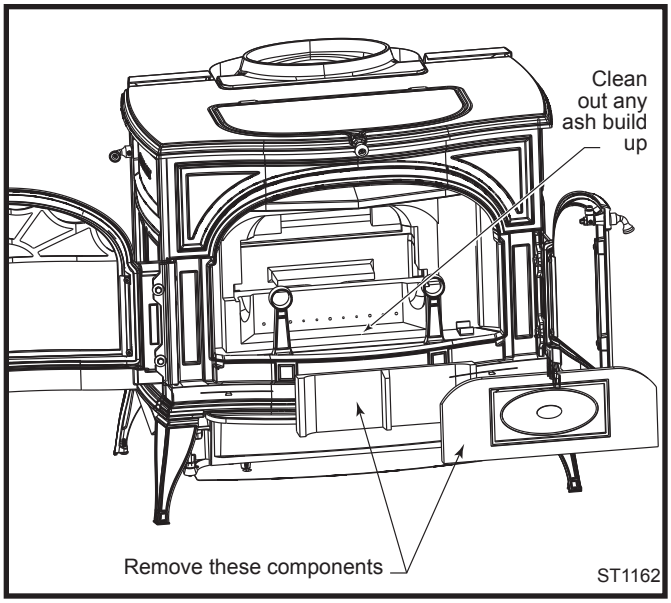


Fig. 47 Inspect and clean out ash accumulation behind the combustion system.

The Catalytic Element

This wood heater contains a catalytic combustor, which needs periodic inspection and replacement for proper operation. In the United States it is against the law to operate this wood heater in a manner inconsistent with the operating instructions in this manual.

Under normal operating conditions, the catalytic combustor should remain active for two to six years (depending on the amount of wood burned). However, it is important to monitor the combustor periodically to ensure that it is functioning properly, as well as to determine when it needs to be replaced. A non-functioning combustor will result in a loss of heating efficiency, and an increase in creosote and emissions.

Inspection and Cleaning

Inspect the combustor for fly ash accumulation and physical damage three times per year. Clean the combustor as needed.

The refractory package that houses the catalytic combustor should be inspected for a buildup of fly ash and cleaned if necessary. This may be done when you examine the combustor.

When to Suspect a Combustor Problem

The best way to evaluate the performance of your Defiant's combustor is to observe the amount of smoke leaving the chimney — both when the combustor has "lighted-off" and when it has not. Follow these steps:

- With a fire going and the combustor properly activated, with the damper closed to route smoke through it as described in the Operation Section, go outside and observe the smoke leaving the chimney.
- Then, open the stove damper and once again check the smoke leaving the chimney.

You should see significantly more smoke when the stove damper is open and exhaust does not pass through the combustor. However, be careful not to confuse smoke with steam from wet wood. Steam dissipates in the air quickly; smoke does not.

If this test indicates a problem, consider other possible factors as well, such as the weather or a change in the quality of your fuel. In warm weather, draft is weaker than it is in colder winter weather, and fires can burn sluggishly. Small, hot fires are a good solution under these conditions.

Burning "green" (insufficiently seasoned) wood will result in poorer performance than burning properly seasoned fuel. You may have to run your stove hotter (more air) to achieve acceptable performance using green or wet wood.

Also, consider any changes in your operating routine.

Once you have ruled out any other possible causes for a decline in performance, inspect and clean the combustor if necessary. Be sure to protect any surface you use for setting the stove parts aside.

Inspecting the Combustor

Remove access door and inner fireback. Remove the catalytic combustor by lifting and sliding it towards you. (Fig. 48)

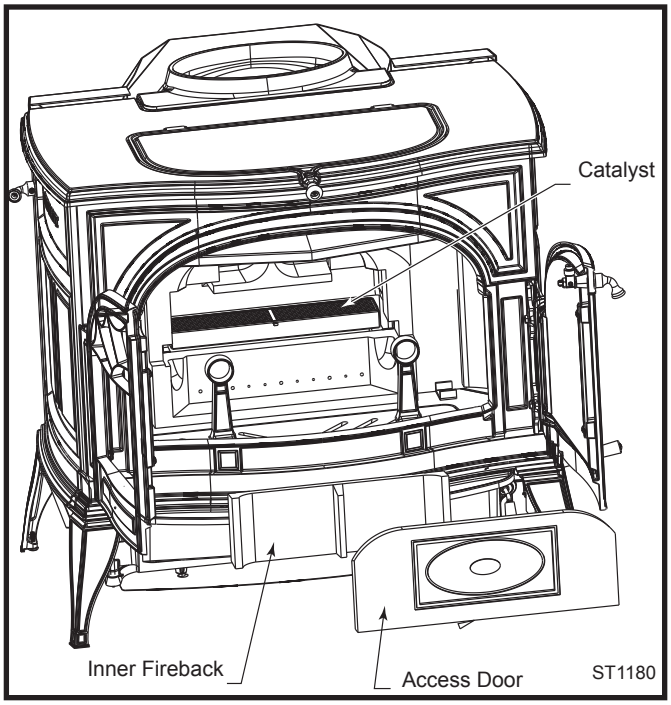


Fig. 48 Inspect the catalytic combustor.

To assure a long life for the combustor, it is recommended to service the combustor on a regular basis based on the amount of use. This procedure takes about five (5) minutes and requires no tools except for a vacuum if cleaning is necessary.

Cleaning the Combustor

1. Check the combustor's honeycomb-like element for a buildup of fly ash. If any is evident, take the combustor outside and clean it by blowing air gently through it. Do not push anything through the honeycomb; do not use compressed air to clear the passages. Such abrasion can scrape the thin coating of platinum (the catalyst) off the ceramic base, shortening the catalyst's life and reducing its effectiveness.
2. Inspect the element for damage or degradation. Although small hairline cracks will not affect performance, the element should be essentially intact. If the element is broken in pieces or has sections missing, it should be replaced. Call your local Vermont Castings Authorized Dealer for a replacement element.

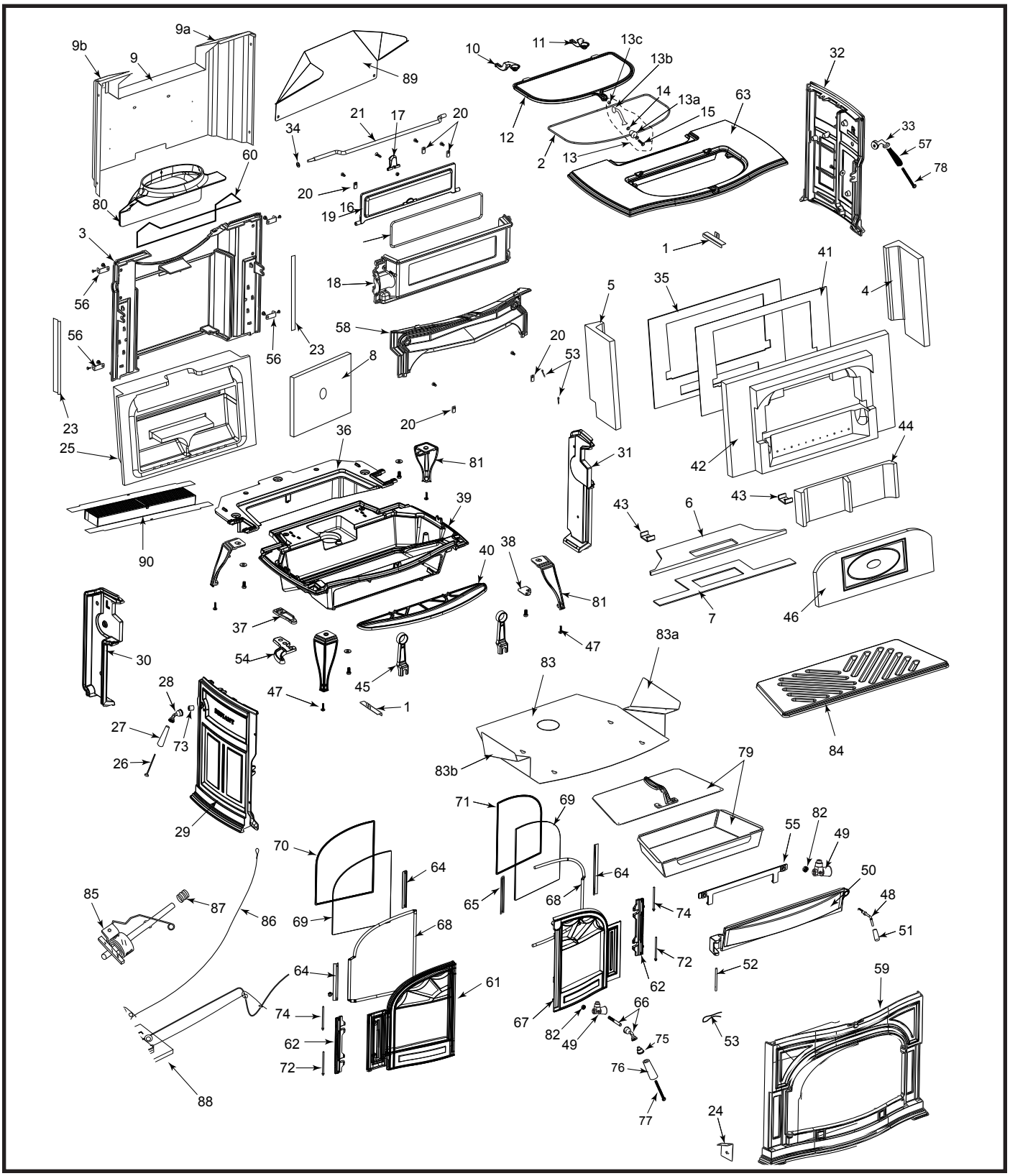
3. If the element is in good condition and clean, re-install it in the stove and replace the refractory inner fireback and access door.

Operate the stove in your usual manner for two weeks, inspecting the chimney and the chimney connector frequently during this period.

If creosote does not build up as fast, it is likely that the performance change was caused by fly ash deposits on the catalytic element. However, continue the inspections of the chimney system for a few weeks to ensure that proper performance continues.

If you continue to find a significant creosote buildup or if you continue to see excessive smoke from the chimney, the catalytic element will need to be replaced. Contact your nearest Vermont Castings' Authorized Dealer for information about a replacement element.

NOTE: Use only the replacement catalyst supplied by a Vermont Castings dealer.



MHSC reserves the right to make changes in design, materials, specifications, prices and discontinue colors and products at any time, without notice.

Defiant Woodburning Stove

Defiant Woodburning Stove Model 1975 (continued)

	Item Description	Part Number
1.	Brick Support Bracket	30005279
2.	Griddle Gasket	1203668
3.	Back	30005242
4.	Refractory Rt End	30005206
5.	Refractory Lt End	30005207
6.	Refractory Support	30005233
7.	Gasket, Fiber, Refractory Support	30005237
8.	Back Insulation Board	30005269
9.	Outer Back	30005485
9a.	Right Air Deflector	30005489
9b.	Left Air Deflector	30005490
10.	Left Griddle Quadrant	30002399
11.	Right Griddle Quadrant	30002401
12.	Griddle	30005257
13.	Complete Griddle Handle Assy	30002775
13a.	Griddle Handle Wood	1600661
13b.	Griddle Handle CRS-BN1	30002715
13c.	Nut Hex 1/4-20	1203210
14.	Griddle Handle Bushing	1201900
15.	Griddle Handle Bolt	1201308
16.	Damper Gasket	1203588
17.	Damper Ramp	1300643
18.	Damper Housing	30002821
19.	Damper[1]	30002816
20.	Damper Tab[1]	1601488
21.	Damper Rod[1]	1600065
23.	Gasket, Fiber Back Refractory	30005270
24.	Rheostat Bracket	30002863
25.	Refractory, Engine - E/D	30005202
26.	Damper Handle Screw	1201310
27.	Damper Handle	1600644
28.	Damper Handle w/Screw Assy	30002720
29.	Left Side	See Chart Pg. 38
30.	Left Air Manifold	30002818
31.	Right Air Manifold	30005243
32.	Right Side	See Chart Pg. 38
33.	Thermostat Handle Base Assy	30002716
34.	Washer Damper Rod	1202560
35.	Fireback Plate, S/S	30005217
36.	Inner Bottom	30005241
37.	Top Ashdoor Hinge	30002836
38.	Door Handle Bracket	30002844
39.	Bottom	30005240
40.	Ashlip	See Chart Pg. 38
41.	Gasket, Fireback	30005209
42.	Refractory, Fireback	30005203
43.	Retainer, Inner Cover Refractory	30005248
44.	Refractory, Inner Cover	30005205
45.	Andiron	30002827

	Item Description	Part Number
46.	Refractory, Access Cover	30006125
47.	Leg Leveller	1201745
48.	Ashdoor Handle Shaft	30005301
49.	Pawl Assy 3/4 short adj	30005157
49a.	Spring Washer	63D0069
50.	Ashdoor	30002810
50a.	Ashdoor Gasket	1203589
51.	Ashdoor Handle (Wood)	1600663
52.	Ashdoor Hinge Rod	30002826
53.	Cotter Pin, Ashdoor	30001749
54.	Ashdoor Bottom Hinge Support	1300642
55.	Ashpan Bracket	30001908
56.	Rear Side Bracket	30002845
57.	Thermostat Handle	1600660
58.	Airwash Manifold, Frt	30005244
59.	Front	See Chart Pg. 38
60.	Flue Collar Gasket	30002422
61.	Left Door	See Chart Pg. 38
62.	Door Hinge Strip	1300645
63.	Top	See Chart Pg. 38
64.	Glass Clip	30001715
65.	Glass Clip (Right Door Only)	30001716
66.	Front Door Handle & Shaft	30002717
67.	Right Door	See Chart Pg. 38
68.	Door Gasket	7000910
69.	Glass Gasket	1203556
70.	Left Door Glass	30005247
71.	Right Door Glass	30005247
72.	Lower Door Hinge Pin	30002727
73.	Spacer (for Damper rod)	1201779
74.	Upper Door Hinge Pin	30002727
75.	Complete Handle Assy	30004175
75a.	Handle Base Stub	30002714
76.	Wood Handle	1600664
77.	Handle Bolt	1201310
78.	Thermostat Handle Bolt	1201243
79.	Ash Pan Assy	30001690
80.	Flue Collar	See Chart Pg. 38
81.	Leg	See Chart Pg. 38
82.	Hex Head Jam Nut	1203290
83.	Bottom Heat Shield	30005037
83a.	Bottom Heat Shield Rt Wing	30005038
83b.	Bottom Heat Shield Lt Wing	30005039
84.	Grate Bottom	30005234
85.	Thermostat Assy.	5005470
86.	Thermostat Cable	5005471
87.	Thermostat Friction Spring	1201846
88.	Primary Air Valve Assy.	30005275
89.	Heat Plate Vertical Flue	30005265
90.	Catalyst, Ceramic	30005353

Defiant Woodburning Stove Model 1975 (continued)

Shell Enamel Parts - Defiant Model 1975					
Part Name	**Classic**	**Biscuit**	**Bordeaux**	**Ebony**	**Brown Majolica**
Top	30002834	30002874	30002915	30002894	30004837
Left Side	30002832	30002872	30002913	30002892	30004834
Right Side	30002831	30002871	30002912	30002891	30004835
Flue Collar	30001576	30002947	30002921	30002910	30004815
Front	30002830	30002873	30002914	30002893	30004836
Ashlip	30002811	30002870	30002911	30002890	30004833
Left Door	30002813	30002876	30002917	30002896	30004842
Right Door	30002812	30002875	30002919	30002895	30004841
Leg	30002835	30002877	30002918	30002897	30004843

NOTES:

In the diagram and throughout this manual, ‘left’ and ‘right’ mean as you face the front of the stove.

When ordering parts, be sure to mention the stove’s model number. When ordering external parts, be sure to specify color.

The hardware in the Defiant is in standard sizes; most bolts are 1/4” diameter by 20 threads per inch. Most hardware stores can supply replacement hardware if you specify bolt diameter, number of threads per inch and length. Fasteners inside the firebox should be replaced with stainless steel for ease of future disassembly.

LIMITED LIFETIME WARRANTY

Limited Lifetime Warranty

MHSC warrants that all refractory brick and material used in this product will be warranted against deterioration not resulting from physical damage or overloading of the woodstove for the lifetime of this product. This coverage includes the components of the 2N1 System: “engine, inner cover, access cover and fireback.” In addition all cast iron parts are warranted against breakage, cracking or burn-through and glass door panels against thermal breakage. Coverage is provided only to the original purchaser. MHSC will also pay labor associated with repairing or replacing the component described above for up to five years.

Limited 5 Year Warranty

The porcelain finish is warranted to be free of defects in material and workmanship for a period of five years from the date you purchase the stove. Warranty excludes chipping, scratching or other surface damage to the porcelain that might result from normal wear and tear and also excludes failure of porcelain coating due to misuse or overfiring.

Limited 1 Year Warranty

The following parts of the woodburning stove are warranted to be free of defects in material and workmanship for a period of one year from the date you purchase the stove: handles, gasketing and thermostat assembly

As designated in the descriptions above, MHSC will repair or replace, at its option, any part found to be defective upon inspection by a Vermont Castings, Authorized Dealer. The customer must return the defective part or the stove, with shipping prepaid, to the Authorized Dealer or pay for any Authorized Dealer in-home travel fees or service charges for in-home repair work. It is the dealer’s option whether the repair work will be done in the customer’s home or in the dealer’s shop. If, upon inspection, the damage is found to be the fault of the manufacturer, repairs will be authorized at no charge to the customer for parts and/or labor. Labor rates will be determined by MHSC’s published labor rates in effect at the time labor is performed.

Any parts repaired or replaced during the limited warranty period will be warranted under the terms of the limited warranty for a period not to exceed the remaining term of the original limited warranty or six (6) months, whichever is longer.

Limited Catalyst Warranty

The catalyst will be warranted for a six year period as follows: If the original catalyst or a replacement catalyst proves defective or ceases to maintain 70% of its particulate emission reduction activity (as measured by an approved testing procedure) within 24 months from the date the stove is received, the catalyst itself will be replaced free.

From 25 - 72 months a pro-rated credit will be allowed against a replacement catalyst and the cost of labor necessary for its installation at the time of replacement.

A third year (25 - 36 months) of no charge replacement will be made when combustor failure is due to thermal degradation of the substrate (crumbling of ceramic material). The customer must pay for any in-home travel fees, service charges, or transportation costs for returning the stove to the Authorized Dealer.

Amount of Time Since Purchase	Credit Towards Replacement Cost
0 - 24 months	100%
25 - 36 months	50%
37 - 48 months	30%
49 - 60 months	20%
61 - 72 months	10%

Any replacement catalyst will be warranted under the terms of the catalyst warranty for the remaining term of the original warranty. The purchaser must provide the following information in order to receive a replacement catalyst under the terms of this limited warranty:

1. Name, address and telephone number.
2. Proof of original purchase date.
3. Date of failure of catalyst.
4. Any relevant information or circumstances regarding determination of failure.
5. In addition, the owner must return the failed catalyst.

Exclusions & Limitations

1. This product must be installed or serviced by a qualified installer, preferably NFI or WETT (Canada) certified, as prescribed by the local jurisdiction. It must be installed and operated at all times in accordance with the Installation and Operating instructions furnished with the product any alterion, willful abuse, accident or misuse of this product shall nullify this warranty.
2. This warranty does not cover misuse of the stove. Misuse includes overfiring which will result if the stove is used in such a manner as to cause one or more of the plates to glow red. Overfiring can be identified later by warped plates and areas where the paint pigment has burned off. Overfiring in enamel fireplaces is identified by bubbling, cracking, chipping and discoloration of the porcelain enamel finish. MHSC offers no warranty on chipping of enamel surfaces. Inspect your woodburning stove prior to accepting it for any damage to the enamel.
3. This warranty does not cover misuse of the stove as described in the Owner’s Guide, nor does it cover an stove which has been modified unless authorized by a MHSC representative in writing. This warranty does not cover damage to the stove caused by burning salt saturated wood, chemically treated wood, or any fuel not recommended in the Owner’s Guide.
4. This warranty does not cover a stove repaired by someone other than a Vermont Castings Authorized Dealer.
5. Damage to the unit while in transit is not covered by this warranty but is subject to a claim against the common carrier. Contact Vermont Castings Authorized Dealer from whom you purchased your stove or MHSC if the purchase was direct. (Do not operate the stove as this may negate the ability to process the claim with the carrier.)
6. Claims are not valid where the installation does not conform to local building and fire codes or, in their absence, to the recommendations in our Owner’s Guide.
7. The salt air environment of coastal areas, or a high-humidity environment, can be corrosive to the porcelain enamel finish. These conditions can cause rusting of the cast iron beneath the porcelain enamel finish, which will cause the porcelain enamel finish to flake off. This warranty does not cover damage caused by a salt air or high-humidity environment.
8. MHSC shall have no obligation to enhance or update any unit once manufactured.

IN NO EVENT SHALL MHSC BE LIABLE FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES. ALL IMPLIED WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS, ARE LIMITED TO THE DURATION OF THIS WRITTEN WARRANTY. THIS WARRANTY SUPERCEDES ALL OTHER ORAL OR WRITTEN WARRANTIES.

Some states do not allow the exclusion or limitations of incidental and consequential damages or limitations on how long an implied warranty lasts, so the above limitations may not apply to you. This warranty gives you specific rights and you may have other rights which vary from state to state.

How to Obtain Service

If a defect is noted within the warranty period, the customer should contact a Vermont Castings Authorized Dealer or MHSC if the purchase was direct with the following information:

1. Name, address, and telephone number of the purchaser.
2. Date of purchase.
3. Serial number from the label on the back.
4. Nature of the defect or damage.
5. Any relevant information or circumstances, e.g., installation, mode of operation when defect was noted.

A warranty claim will then start in process. MHSC reserves the right to withhold final approval of a warranty claim pending a visual inspection of the defect by authorized representatives.

MHSC

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